IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

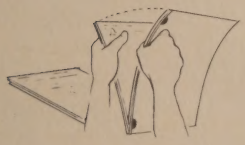
TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.



3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 480 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ APRIL, 1960

CONTENTS PHOTOFACT SET 480

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

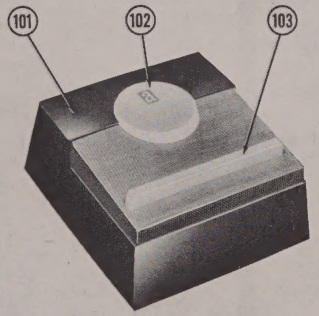
IN THIS ISSUE OF THE SERVICER:

ALLIANCE TENNA-ROTOR
MODEL K-22

The following information on the Alliance Tenna-Rotor Model K-22 is presented through the courtesy of Alliance Manufacturing Co., Alliance, Ohio.

The Alliance Tenna Rotor Model K-22 is actuated by depressing the right or left end of the bar switch located on top of the control box. Depressing the right end rotates the antenna clockwise and depressing the left end rotates the antenna counter-clockwise. An indicator light comes on at the control box when the rotator reaches its full clockwise or counter-clockwise limits. This unit operates at a speed of two RPM giving the operator an approximate direction indication i.e., 15 seconds equals 180 degrees of rotation. The K-22 is identified by the black neoprene weathershield and is interchangeable with the ATR and F-4 Tenna Rotor.

K-22 Tenna Rotors manufactured after June 1, 1958 operate at a speed of one RPM. These can be identified by the date stamp on the rotor and by serial number on the control box. Serial number K54001 and over are one RPM. Earlier Model K-22 rotors may be converted to one RPM by use of our RCR Kit B.



SERVICE PROCEDURE

Power-off Checks

1. Be sure that four conductor cable is connected to the proper terminals. Terminal No. 1 in the rotor should be connected to terminal No. 1 on the control box and so on with No's 2, 3, and 4.

2. Hollow shaft (Item No. 6) must have "play".

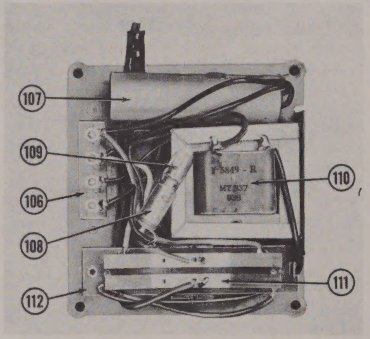
3. Primary input contacts (Item No. 111) within the control box should make solid contact when lever is depressed at either end. There should be at least 1/16 inch clearance in open position.

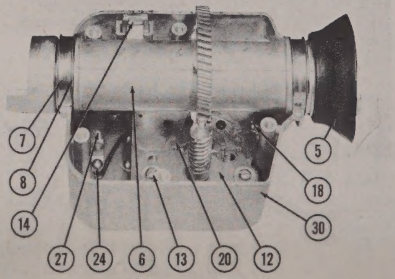
Power-on Checks

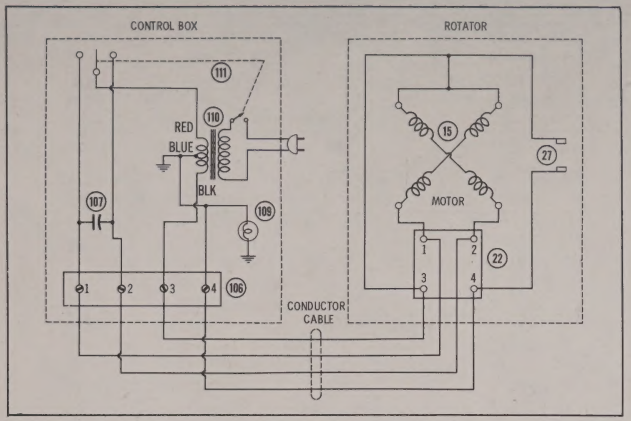
1. Line voltage should be approximately 115 volts.

2. Run unit counter-clockwise by depressing left end of control bar (Item No. 103). Light should come on when unit reaches stop.

3. Run unit clockwise by depressing right end of control bar (Item No. 103). Light should come on when unit reaches stop.

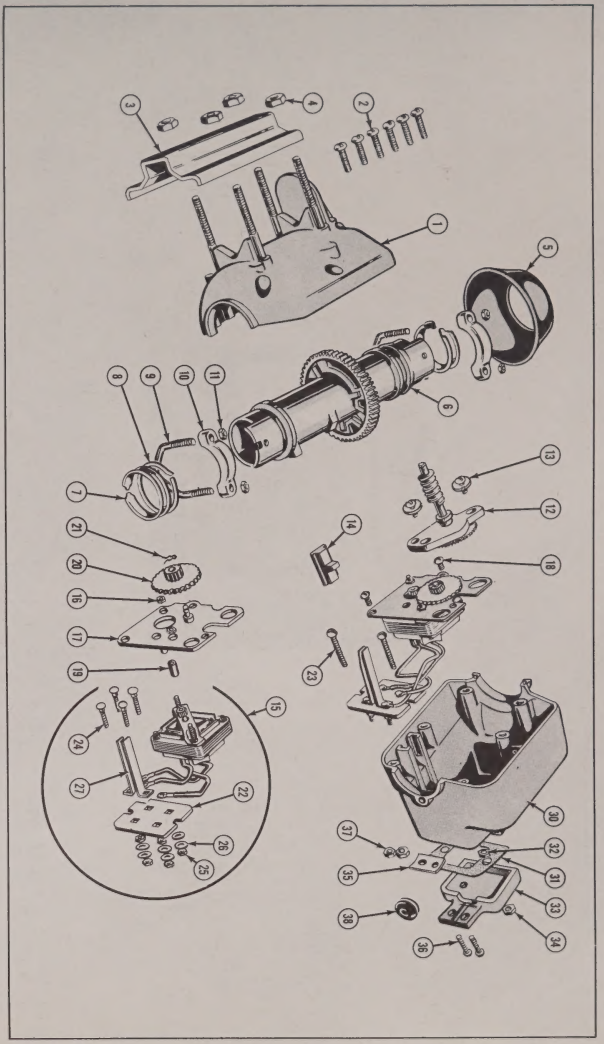






TROUBLE SHOOTING CHART

TROUBLE	CAUSE
Rotor unit fails to operate when control lever is moved for right or left operation.	If motor is inoperative: Check primary input contacts. Check directional switching contacts. Check internal connections in control box. Check capacitor. Check motor. Check four conductor cable for size and length. See Figure 4. If motor is operating: Check gear system to be sure gears are meshing properly and are not slipping where there are staked assemblies.
Rotator operates slowly or sluggishly.	Check hook-up of four conductor cable. Check size and length of four conductor cable. See Figure 4. Check capacitor.
Indicator light fails to come on at stop position.	Check bulb. Check contact spring in rotor.

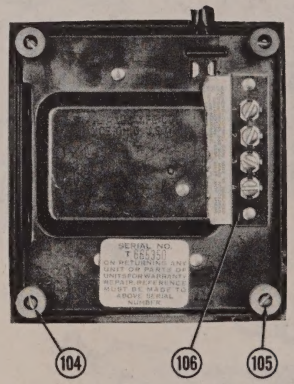


ITEM	NAME	PART No.
	Rotator Assembly	Z-5450-R
1	Housing Assembly RH	Y-5454-R
2	Housing Screws	10-32 x 3/4
3	Clamping Plate	X-5456-A
4	Nut, Hex	1/4 x 20
5	Weather Shield	X-3375-A
6	Shaft Assembly	Y-5463-S
6A	Shaft Assembly (1RPM)*	Y-5463-T
7	Bearing Collar	X-3987-A
8	Thrust Washer	X-3376-A
9	U-Bolt	X-3377-A
10	Mast Clamp	X-3319-A
11	Nut, Hex	10-32
12	Worm Assembly	Y-5462-R
12A	Worm Assembly (1RPM)*	Y-5462-A
13	Screw, RH Washer	8-32 x 3/8
14	Stop Slide	X-3320-A
15	Motor & Term	Y-5451-S
16	Nut, Hex	6-32
17	Mounting Plate Assembly	X-4263-R
18	Screw, RHM	8-32 x 3/8
19	Spacers	X-4141-A
20	Gear & Pinion Assembly	X-3373-R
21	Retaining Ring	X-4243-H
22	Terminal Plate	X-4253-A
23	Screw, RHM	8-32 x 1
25	Nut, Hex	8-32
26	Washer	#8
27	Contact Spring	X-3358-A
30	Housing Assembly LH	Z-5326-B
31	Gasket	X-5449-A
32	Nut, Hex	8-32
33	Terminal Cover	Y-5327-A
34	Nut	8-32
35	Strain Relief Clamp	X-3380-A
36	Screw, RHM	6-32 x 1/2
37	Nut, Hex	6-32
38	Grommet	X-3387-B
Not Shown	Control Pivot Pin	X-1091-M

*Used on 1RPM Rotors manufactured after June 1, 1958. Serial numbers K54001 and over.

CONTROL BOX

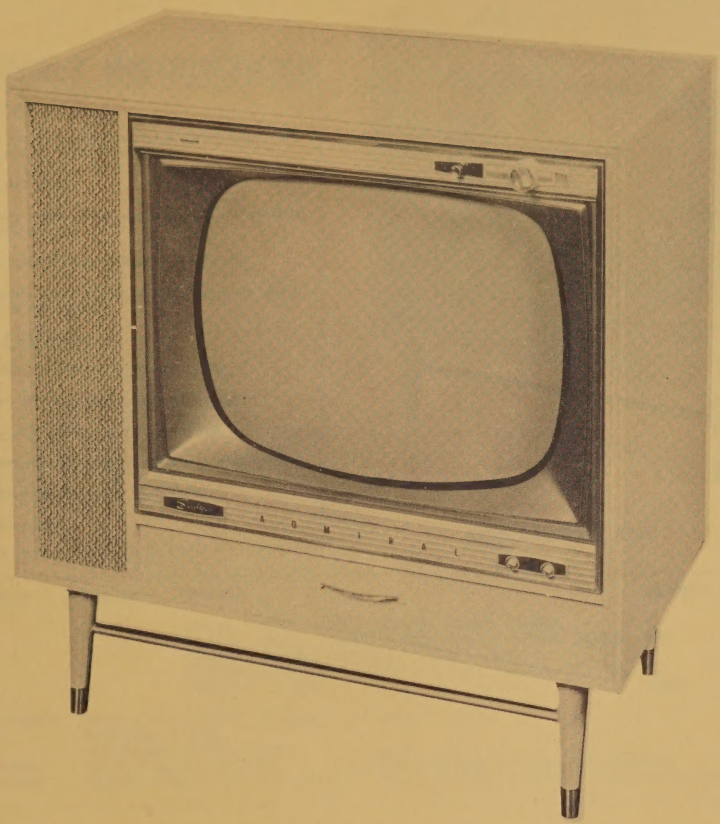
	Control Box Complete	Z-5859-R
101	Case	Z-5836-A
102	Medallion	X-5858-A
103	Control Bar	X-5484-A
104	Screw, Self Tapping	6-20 x 1/2
105	Screw, Self Tapping	6-20 x 1/2
106	Term. Strip Assembly	X-3803-S
107	Capacitor	X-4098-A
108	Light Socket Assembly	Y-5558-R
109	Bulb (Type 47)	X-4274-A
110	Transformer	Y-5849-R
111	Switch Assembly	X-5864-R
112	Insulating Strip	X-5351-A



PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL CHASSIS 20S6, 20US6

ADMIRAL CHASSIS 20S6, 20US6



MODEL L22M23 (Ch. 20S6)

ADMIRAL CHASSIS 20S6, 20US6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 480 FOLDER 1

PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL CHASSIS 20S6, 20US6

ADMIRAL CHASSIS 20S6, 20US6

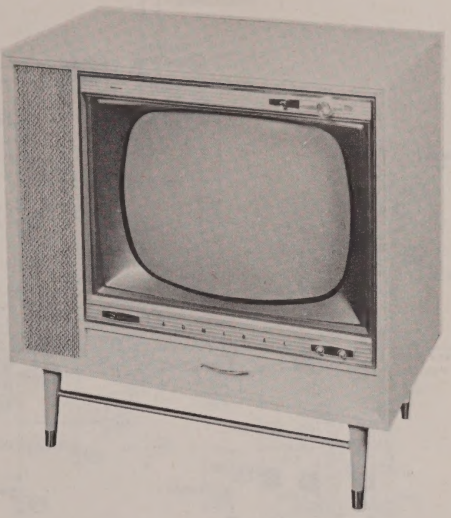
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove rear cover by compressing 11 spring clips. Remove antenna lead. Remove rear cover.
2. Remove speaker leads.
3. Remove 4 bolts holding front escutcheon to cabinet from inside the cabinet.
4. Remove 4 chassis bolts from bottom of chassis.
5. Remove chassis, picture tube and escutcheon by sliding out the front of the cabinet.

PICTURE TUBE REMOVAL

1. Remove chassis, picture tube and escutcheon.
2. Remove yoke, HV lead and picture tube socket.
3. Lay unit on a soft surface on the front glass.
4. Remove 4 screws holding picture tube mounting wire.
5. Remove picture tube mounting strap bolts.
6. Remove picture tube.



MODEL L22M23 (Ch. 20S6)

TRADE NAME	Admiral	MODELS	CHASSIS
		C22M11, C22M12, C22M13, C22M22, C22M23, C22M24, L22M22, L22M23, L22M24, T22M10, T22M11, T22M12, T22M13	20S6
		C22UM11, C22UM12, C22UM13, C22UM22, C22UM23, C22UM24, L22UM22, L22UM23, L22UM24, T22UM10, T22UM11, T22UM12, T22UM13	20US6
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF-Sixteen, UHF-Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 165 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 4 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

A fuse wire is used for filament protection. (For location, see M2 in photo "Chassis Bottom View".)

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)
Some models may use a 3/4A S/B fuse as alternate in this application.

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Lock coil. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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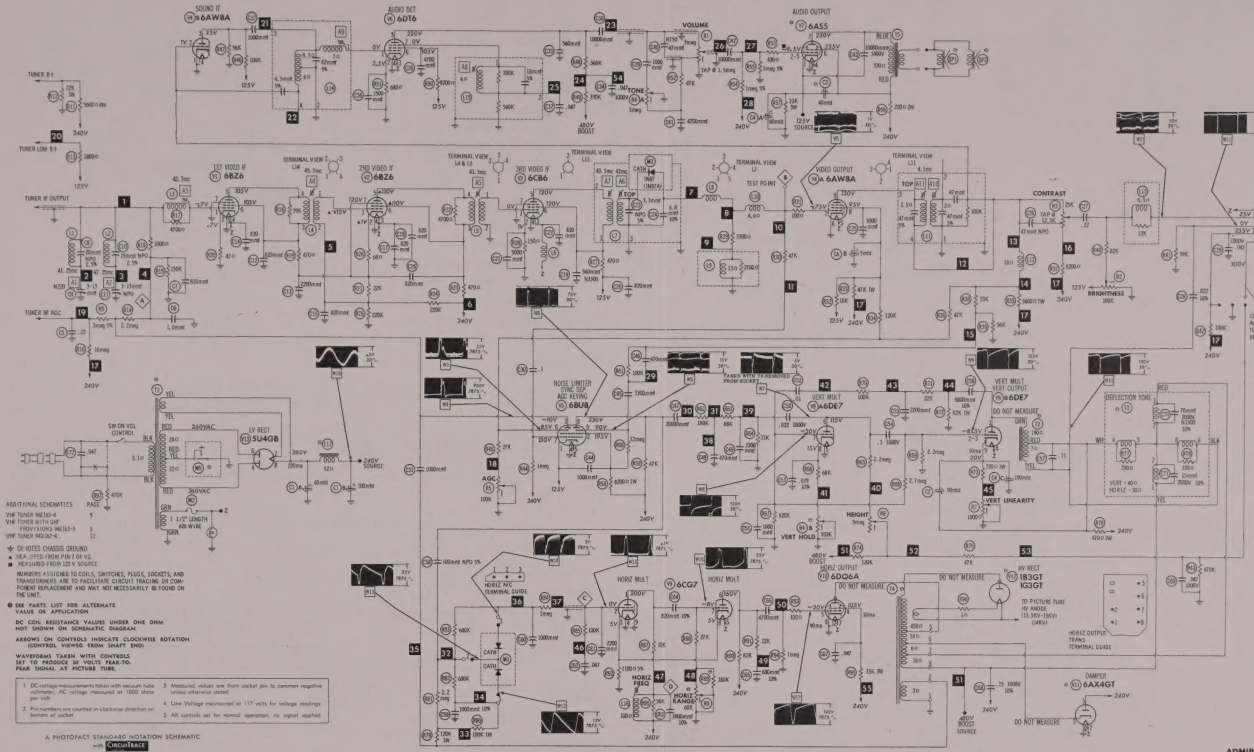
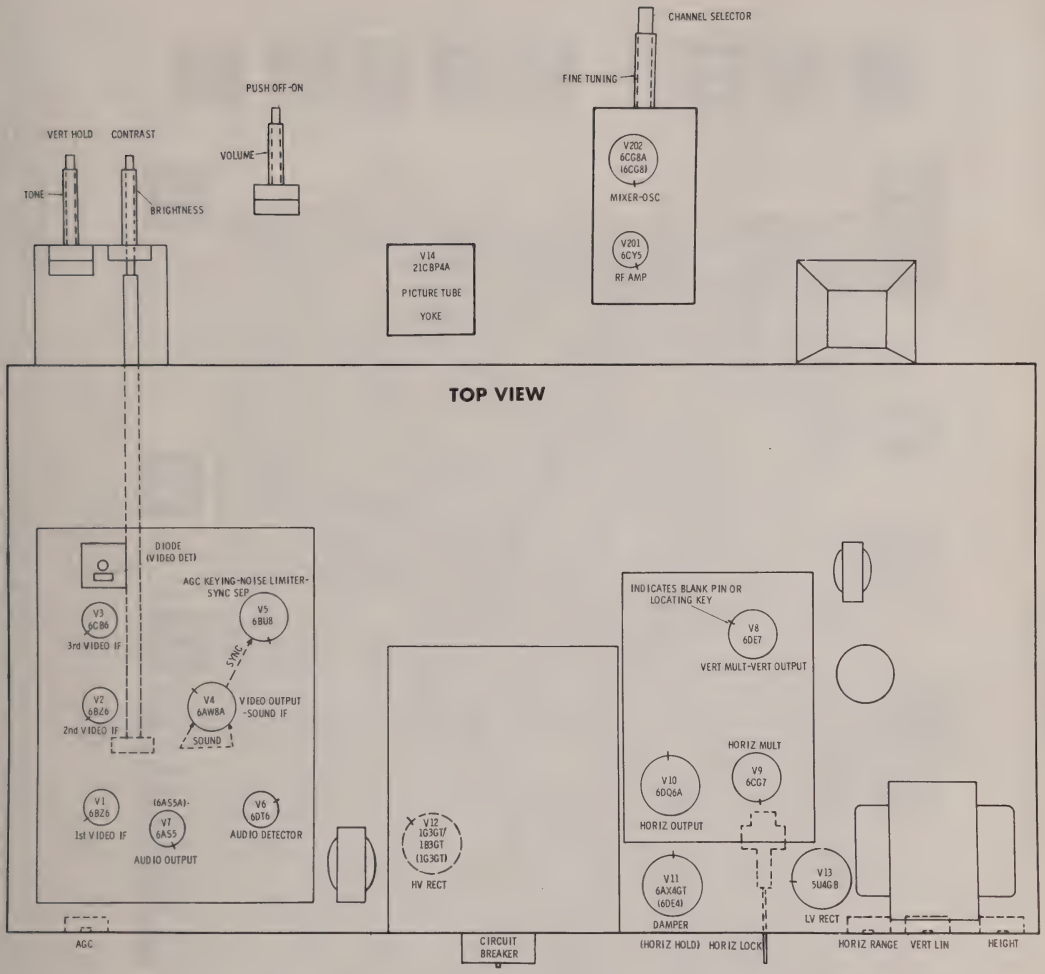
JA806

SET 480 FOLDER 1



ADMIRAL CHASSIS
2056, 20US6

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wire (Filament), Circuit Breaker, V13

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

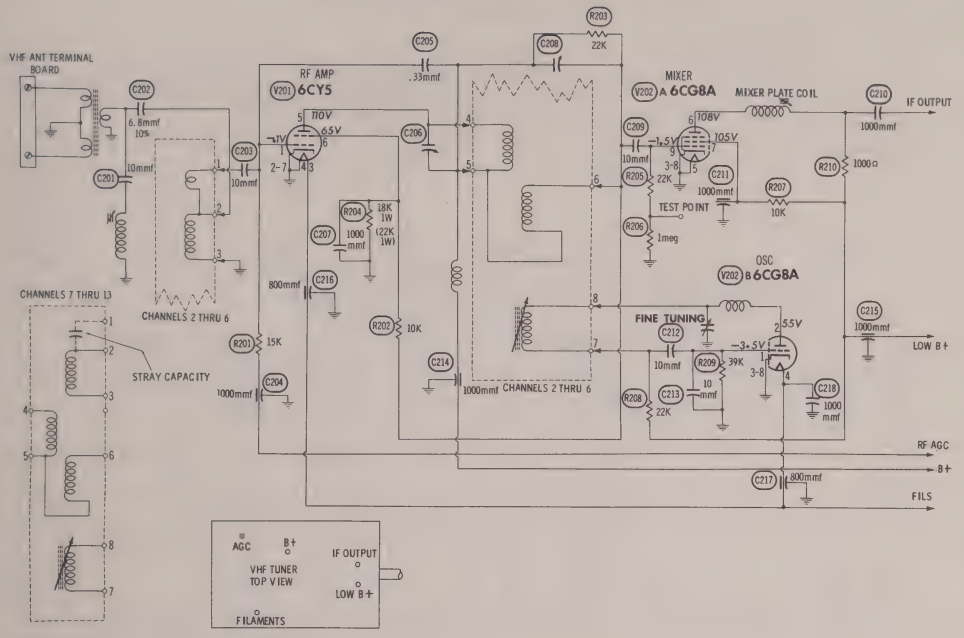
SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5

CircuiTrace Numbers 1 thru 37

A Howard W. Sams CIRCUITRACE® Photo

MAIN PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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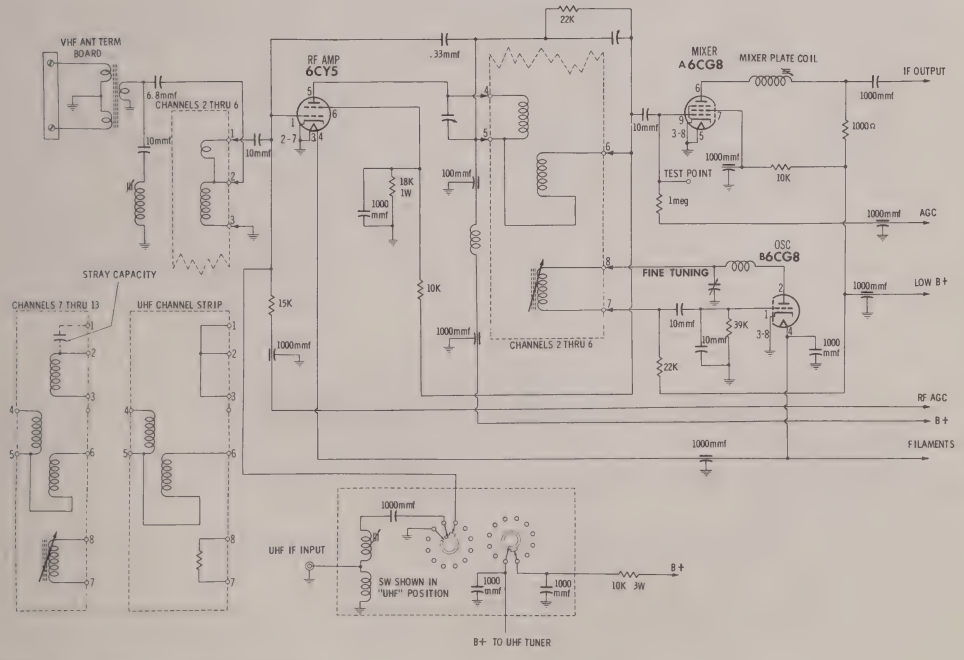
VHF TUNER 94E163-4



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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VHF TUNER with UHF Provisions - 94E163-5

TUNER PARTS LIST AND DESCRIPTIONS

94E163-4

TUBES

• CBS •		GENERAL ELECTRIC •		• RAYTHEON •		• SYLVANIA •	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE
V201	RF Amp.	6CY5		V202	Mixer-Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	6.8 10%		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C203	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	.33							
C206								
C207	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C208								
C209	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C210	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C213	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	800		EF-001	MFT-1000		CCF-102	CT280A	
C217	800		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	15K	
R202	10K	
R203	22K	
R204	18K 1W	(22K 1W)*

* Alternate value.

ITEM No.	RATING	REMARKS
R205	22K	
R206	1meg	
R207	10K	
R208	22K	

ITEM No.	RATING	REMARKS
R209	39K	
R210	1000Ω	

TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A) thru a 10K resistor. Positive to chassis.
Connect a jumper across the antenna terminals.
Connect a 270mmf capacitor across the VTVM leads.
Set Contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	41.25 MC (Unmod)	Any non-interfering channel	DC probe thru 47K to point (B). Common to chassis. (Across Video Det. load)	A1	Use high generator output. Adjust for MINIMUM deflection.
2.	"	"	47.25MC	"	"	A2	"
3.	"	"	42.3MC	"	"	A3	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
4.	"	"	45.3MC	"	"	A4, & Mixer Plate Coil	"
5.	"	"	41.5MC	"	"	A5	"
6.	"	"	42.0MC	"	"	A6	"
7.	"	"	43.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Set Contrast fully clockwise.
If an external marker is used, couple loosely to sweep generator lead.
Connect a 270mmf capacitor across the scope leads.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	43MC (10MC Swp)	41.25MC 42.0MC 43.5MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)		Check for response similar to Fig. 1 with markers as shown. If necessary, retouch Mixer Plate Coil to position 45.75 MC marker and A7 to position 43.5MC marker and to correct shape of curve.

SOUND IF ALIGNMENT

Tune in the strongest TV station available in the area. Adjust the set for normal operation.
Turn A8 slowly counterclockwise until a buzz is heard in the sound, then turn clockwise for maximum undistorted sound. (There may be two points approximately 1/2 turn apart at which the sound is loud. Set slug at center range of second loud point as slug is turned clockwise).
Reduce the signal at the antenna terminals (by use of an adjustable attenuator or disconnecting the antenna) until a strong hiss is heard in the sound. Carefully adjust A9 and A10 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, reduce the signal more until the hiss returns and readjust A9 and A10. If the sound is unsatisfactory, repeat procedure.

4.5MC TRAP ALIGNMENT

Adjust A11 for MINIMUM 4.5MC beat pattern in the picture. (4.5MC beat interference appears as a very fine crosshatch pattern on the screen.)

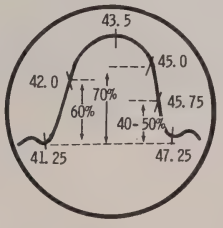
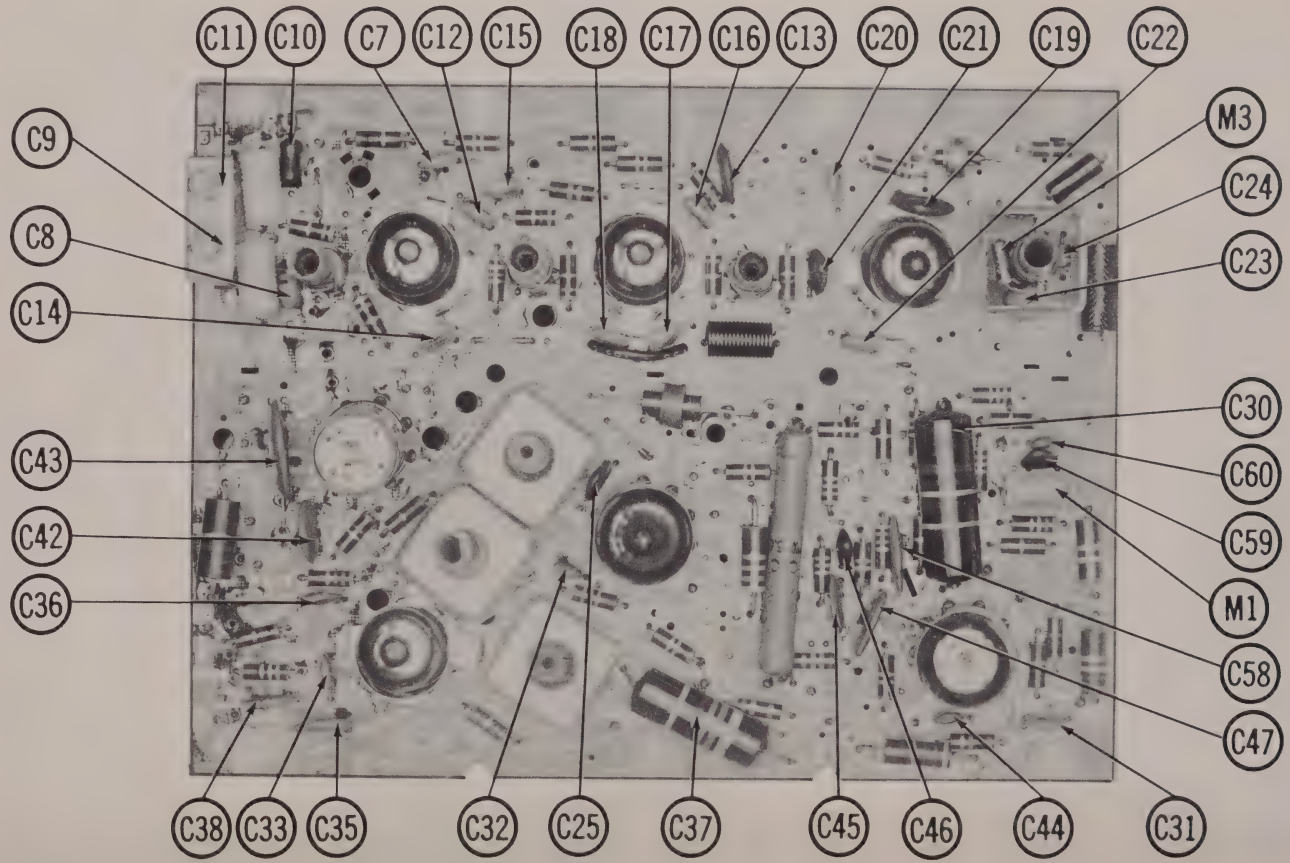
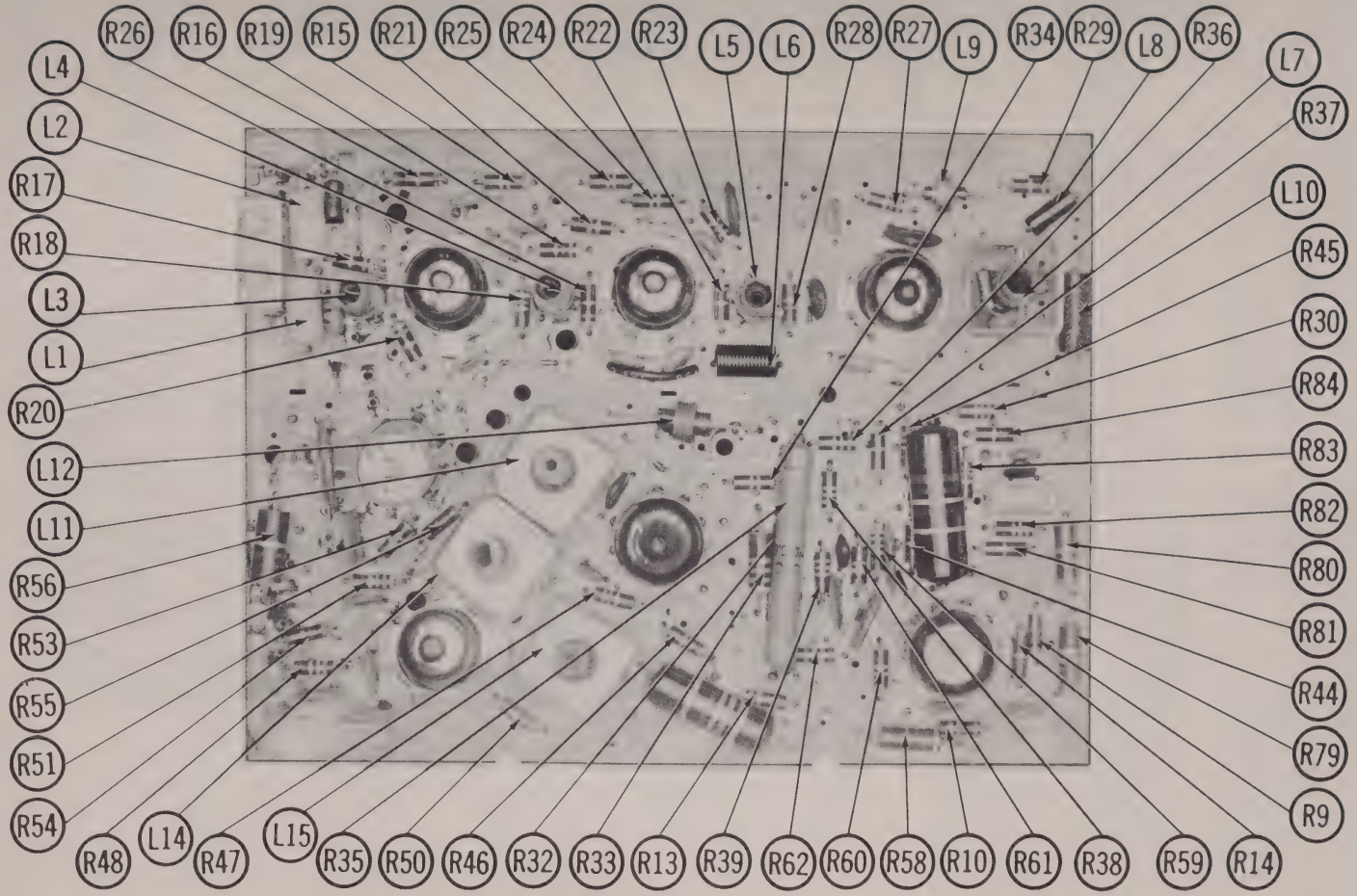


FIG.1



MAIN PRINTED BOARD - CAPACITOR & MISC. IDENT.



MAIN PRINTED BOARD - RESISTOR & INDUCTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA
	USE	TYPE	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V7 Audio Output	6AB8 (6AB5A)*
V2	2nd Video IF Amp.	6BZ6	V8 Vert. Mult.-Vert. Output	6DE7
V3	3rd Video IF Amp.	6CB6	V9 Horiz. Mult.	6CG7
V4	Video Output-Sound IF Amp.	6AW8A	V10 Horiz. Output	6DQ6A
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8	V11 Damper	5AX4GT (6DK4)*
V6	Audio Detector	6DT8	V12 HV Rect.	1B3GT/8B3GT (6GH7)*
			V13 LV Rect.	5U4GB

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA					NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	21CBP4A	21CBP4A ①	21CBP4-A ①	21CBP4/ 21CBP4A ②	21CBP4/ 21CBP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP.	VOLT.	ADMIRAL PART No	AEROVOX PART No	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No.
C1A	±40	350	67TD3-323	AFH3-6425	BO483	FP347	TMD-R	TVL-3536
B	±100	350						
C2	50	350	67TD3-326	AFH3-41	AS190	FP137	TMD-46	TVL-1622
C3	40	350	67TA-8 ①	PRB1580	BR403S	TC53	TC-40-350	TVA-1511
C4A	±60	300	67TD3-332	AFH3-54-60	BO576			TVL-3457
B	±5	300			BR835			TVA-1310
C	100	50						

① Alternate Part #67A4-R.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.22 300V		P388N-22		CUB3F22	22F-3-224	GEM-3022	27TM-P22
C6	1.0 100V		P388N-1.0		CUB2W1		GEM-2	27TM-M1
C7	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C8	30 MPC 2.5%	#66DB-143						
C9	2-13 N220	#66A39-T						
C10	15 MPC 2.5%	#66DB-140		TCZ-15				
C11	2-13 N90	#66A33-T						
C12	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C13	3300		BPD-0022	DD-222	BYA0D22	CCD-223	GP223	58K-D22
C14	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C15	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C16	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C17	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C18	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C19	560	N330G	#66DB-131			*		
C20	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C21	5000		BPD-005	DD-502	BYA0D5	CCD-502	GP350	58K-D50
C22	330		DL-330	DD-82	BYA0T82	CCD-82	GP382	10TS-T82
C23	3.3 NPO 5%		NPO-DI 3.3	DTC-3R3	CH5W3C	CCD-3R3	CNO-333	10TCC-Y33
C24	8.8 10%		NPO-DI 8.8	TCZ-8R8	CH5W8C	CCD-8R8	CNO-588	10TCC-Y88
C25	5000		BPD-005	DD-502	BYA0D5	CCD-502	GP350	58K-D50
C26	47 NPO		NPO-DI 47	DTZ-47	C0QW1C	CCD-470	CNT-447	10TCC-Q47
C27	.33 400V		P488N-33		CUB4P33	4DP-3-334	GEM-4033	47TM-P33
C28	.033 600V 10%		Y84C-333		PMS832	6DP-3-333	GEM-6S12	57TM-S33
C29	.047 1000V		P108N-047	DD-503	CUB1W47	16DP-5-473	GEM-1D47	10TM-D47
C30	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	47TM-P1
C31	1000		BPD-001	DD-103	BYA0D1	CCD-103	GP30	58K-D10
C32	1000		BPD-001	DD-103	BYA0D1	CCD-103	GP30	58K-D10
C33	1500		DL-680	DD-56	LST56	CCD-681	GP368	10TS-T56
C34	.047 1000V		P108N-047	DD-503	CUB1S47	16DP-5-473	GEM-1S47	10TM-S47
C35	4700		BPD-047	DD-472	BYA0D47	CCD-472	GP347	58K-D47
C36	1500		BPD-005	DD-152	BYA0D5	CCD-152	GP35	58K-D05
C37	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4S47	47TM-S47
C38	1000		BPD-001	DD-103	BYA0S1	CCD-103	GP10	58K-S10
C39	1000		BPD-001	DD-103	BYA0S1	CCD-103	GP30	58K-D10
C40	47 NPO		NPO-DI 47	DTN-47	C0QW1U	CCD-470	CNT-447	10TCC-Q47
C41	4700		BPD-0047	DD-473	BYA0S047M	CCD-472	GP347	58K-D47
C42	10000		BPD-010	DD-103	BYA0S047M	CCD-103	GP10	58K-S10
C43	10000 .1400V		DAC-37	DD58-103	HV15R8	16DP-5-103	GEM-16S3	UAC-103
C44	1000		BPD-001	DD-103	BYA0S01	CCD-103	GP30	58K-D10
C45	3300		BPD-0033	DD-332	BYA0D33	CCD-332	GP233	58K-D33
C46	470		BPD-0047	DD-471	BYA0D47	CCD-471	GP347	58K-D47
C47	30000		BPD-03	DD-303	BYB8S3	CCD-303	GP130	58K-S30
C48	470		BPD-0047	DD-471	BYA0T47	CCD-471	GP347	10TS-T47
C49	3300		BPD-0033	DD-332	BYA0D33	CCD-332	GP233	58K-D33
C50	.022 1000V		P108N-022	DD-223	CUB0S22	16DP-4-223	GEM-1S22	10TM-S22
C51	1000		BPD-001	DD-102	BYA0D1	CCD-103	GP30	58K-D10
C52	.01 600V		P488N-0	DE-103	CUB6E	6DP-3-103	GEM-6E1	57TM-E
C53	.039 600V 10%		P984C39-039		PMS84	6DP-3-393	GEM-16I4	57M-96
C54	.1 1000V		P108N-1		CUB2S1			10TM-P1
C55	3300		BPD-0033	DD-332	BYA0D33	CCD-332	GP233	58K-D33
C56	6800 10%		P488N-68		PMS268	CCD-682	GEM-S268	10TS-D68
C57	15 400V				CUB4P15	4DP-4-154	GEM-4S19	47M-P15
C58	100 NPO 5%			DTZ-100	C0TCC	CCTO-101	CNO-310	10TCC-T10
C59	1000 10%		DL-1000	DD-102	PMS21	CCD-102	GP20	10TS-D10
C60	1000		BPD-001	DD-102	BYA0S01	CCD-102	GP25	58K-D10
C61	3300		BPD-033	DD-332	BYA0D33	CCD-223	GP230	58K-D32
C62	.047 300V		P388N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	27TM-347
C63	1800 10%		1484-0038		IR1S09	CM-20B-182K	MC2G18.5	MS-2S9
C64	820 10%		1489-00083	DD-82	1S2T82	CM-20B-822K	MC2S21	MS-2S2
C65	680 10%		1489-00068	DD-68	1S2T68	CM-20B-681K	MC2S49	MS-2S8
C66	4700		BPD-0047	DD-472	BYA0D47M	CCD-472	GP347	58K-D47
C67	.047 400V		P488N-041	DD-503	CUB4S47	4DP-3-473	GEM-4S47	47M-S47
C68	.15 1000V 10%	#64B2-54						
C69	.047 1000V		P108N-047	DD-503	CUB1S47	16DP-5-473	GEM-1S47	10TM-S47
C70	70 2000V 20%-10%	#66DB-209						
C71	15 2000V 10%	#66DB-23						
C72	.047 600V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6S47	57M-S47

* Admiral Part No. * Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.
R1A	3meg	½	72B44-4			B1S-140X	P252DT36 + DS-37
B	Shaft					6S3	
C	Switch					Not Req.	
R2	100K	½	72B54-1				
R3	25K	½	72DB2-126				
	12.5K tap						
R4A	500K	½	72B47-34		RTV-604	† Ⓦ-1149	UE6087
B	100K						
R5A	100K		72DB2-118	AB-38	B47-100K-E	B1T-138	PTA1S
B	Shaft			AK-19	Not Req.	T364	Not Req.
R6A	50K	½	72DB2-137	BX-81 ✱	B47-50K-E	B1U-138 ✱	PTA54L ✱
B	Shaft			Not Req.	Not Req.	T364	Not Req.
R7A	1000Ω	½	72DB2-138	AB-5	B47-1000-E	B1U-108	PTA1S
B	Shaft			AK-1	Not Req.	T364	Not Req.
R8A	5meg	½	72DB2-119	AB-37	B47-5meg-E	B1U-141	PTA54L
B	Shaft			Not Req.	Not Req.	T364	Not Req.

Note 1. Some versions may use 300K (Vert. Hold) (Part #75C83-105).
Note 2. Some versions may use 45K (Horiz. Range) without shunting resistor (R89).
✱ Ensure shunting resistor.
† "Concentrizit" Equivalent: K-6 Kit with Base Elements & Shafts: B13-141, P17-118 (Panel)
B1J-131, R1-130 (Rear)

✱ Do not use Tap #.
✱ "STA-LOC" Equivalent: FA58A, RU35L, OH1642A, 192062.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING	REMARKS
R9	3meg 5%	
R10	10meg	
R11	3000Ω 4W	#61B24-443
R12	22K 3W	#60B34-357
R13	180Ω	
R14	2.2meg	
R15	150K	
R16	1000Ω	
R17	4700Ω	
R18	390K	
R19	4700	
R20	47Ω	
R21	330K	
R22	4700Ω	
R23	470Ω	
R24	220K	
R25	220K	
R26	68Ω	
R27	470Ω	
R28	330Ω	
R29	3300Ω	
R30	47K	
R31	100Ω	
R32	56K	
R33	47K 1W	
R34	330K	
R35	5600Ω TW	#61B34-743
R36	47K	
R37	8200Ω	
R38	33K	

ITEM No	RATING	REMARKS
R39	56K	
R40	82K	
R41	39K	
R42	100K	
R43	470K	
R44	1meg	
R45	47K	
R46	100K	
R47	56K	
R48	560K	
R49	330K	
R50	4300Ω	
R51	680Ω	
R52	47K	
R53	100Ω	
R54	1meg 5%	
R55	1meg 5%	
R56	120Ω 2W	
R57	10K 1W	#61B24-349
R58	4200Ω 1W	
R59	47K	
R60	12meg	
R61	100K	
R62	1MΩ	
R63	68K	
R64	33K	
R65	2.2meg	
R66	68K	
R67	820K	
R68	2.7meg	

ITEM No	RATING	REMARKS
R69	2.2meg	
R70	100K	
R71	22K	
R72	82K 1W	
R73	3300Ω 1W	
R74	120K	
R75	47K	
R76	4700 2W	#61A1-45
R77	330Ω	
R78	330Ω	
R79	120K 1W	
R80	100K 1W	
R81	2.2meg	
R82	680K	
R83	680K	
R84	1meg	
R85	100K	
R86	56K	
R87	56K	
R88	27K	Note 1
R89	180K	
R90	82K	
R91	22K	
R92	1000Ω 5%	
R93	100Ω	
R94	2meg	
R95	15K 2W	#60B34-159
R96	1Ω	
R97	470K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.
L1	4L 25MC Trap Coil	72B37-4					
L2	4T 25MC Trap Coil	72B37-4					
L3	1st Video IF	72C33-31					
L4	2nd Video IF	72C33-39					
L5	3rd Video IF	72C33-39					
L6	Fil. Choke	72B37-2	19-1001	19-1001	BC-562	4804	
L7	4th Video IF	72BH8-3 ①					
L8	RF Choke	72B31-4					
L9	Shunt Peaking Coil	72C5-4 ②	19-4000 †	19-4000 †	TV-303 †	6136 †	
L10	RF Choke	72B31-3					
L11A	4.5MC Trap	72C35-2					
B	1st Sound IF						
L12	Shunt Peaking Coil	72C5-30	19-3500	19-3500	TV-188	6174	
L13	Series Peaking Coil	72C5-3 ③	19-4301 ††	19-4301 ††	TV-187 ††	6154 ††	
L14A	2nd Sound IF	72C306-1					
B	Phase Shift Coil						
L15	Quadrature Coil	72C163-37					

① Includes C22, C24 and M3.
② Wound on 27000Ω resistor.
③ Wound on 12K resistor.

† Parallel with 2700Ω resistor.
†† Parallel with 12K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.
L16	100Ω		94C17-7	HS-8 ①	TV-183 ①	6120 ①	H-103 ①	HS-5 ①

NOTES: ① Horiz. Stabilizer ② Enlarge slug. hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 $\sqrt{\Omega}$	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L17	220A	92Ω	1.1 Hy.	74C16-31 ①	28C4S	T-29S6 ②	P-500 ②	C-2S36 ②	28C4S	C-32X ①

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V 60 1.9A	5.2/2VCT 4/ 2.22A	5V 3A	80D65-18 ①	26R53	P-1886		P-8256	26R53	R-75BA
	SEC. 3	SEC. 4	SEC. 5							
	6.3V 5A	7.5A								

① Chassis 20U86 uses Part #80D65-19.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	79C43-32	28S73	A-2S54	V30T 1	8S6W 1	VO-102 ②	28S73	A-18JX ②
	Alt. Vert. Output	79B43-23	28S73	A-2S54	V30T 1	VO84 1	VO-102 ②	28S73	A-18JX ②
T3	Yoke-Horiz. (16.5MC) (90°)	94C69-2 (or) 94D87-30 (or) 94D59-1	Y-18 ③	MDF-92 ④⑤⑥	V90F19/40 ④⑤⑥	PCM2045 ④⑤⑥	DY-18A ④⑤⑥	Y-18 ③	T-46 ④ NW-11 ④⑥
	Rear Cover & Centering Device	94B18-1							TC-1 E C1-1
	Yoke Clamp	18A230-2							D-19I
T4	Horiz. Output	79C77-6							D-19I
	Alt. Horiz. Output	79B77-6							

① Use on metal yoke damping networks.
② Mount with leads on bottom and connect same as original.
③ Requires additional 33mmf @ 2KV and 15mmf @ 2KV damping capacitors.
④ Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	8000Ω	3-4Ω	79B6L-6	34S05	A-2900	AU-608	A-3856	34S05	R-32E	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	5"	PM	8-9Ω	76D139-16 ①	5A12S.6	① Models L23M23, 33, 34, L12UM13, 23, 34
SP2	5"	PM	8-9Ω	76D139-14 ②	5A12S.6	② Models T12M13, 13, 18, 13, T12UM05, 11, 13, 13
				76D139-13 ③		③ Models C12M11, 13, 13, 23, 23, 34, C12UM11, 13, 13, 23, 23, 34
				76D139-12 ④		
				76D134-7 ⑤		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	ADMIRAL PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		93B6-8		E3616			Dual Sel. Diode

FUSES

ITEM No.	RATING	REPLACEMENT DATA						
		ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.		
		FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2	1½" Length	#26 Wire						
								12ch 10ch 20ch
								5/32ch

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N87 †		1N83S	1N39S	1N39S	Video Detector (Pigtail)

† Alternate 1N97A.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuner	94C163-4	VHF Ch. 2O3S
	Tuner	94C153-6	VHF Ch. 2OU36
	Tuner	94D153-4	UHF
M5	Circuit Breaker †	84B7-1	
	Printed Board	A7B06-1	Video, Sync, Sound
	Printed Board	A7B2-1	Sweep

† Some models may use 3/4A, 8/B fuse (Part #84A13-38) as alternate.

ADMIRAL CHASSIS 20S6, 20U56

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

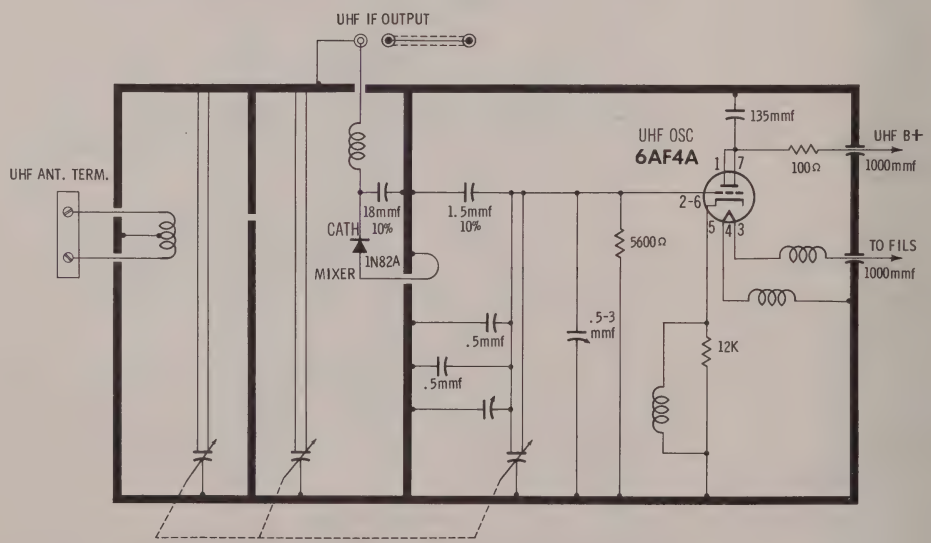
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	21D111-5	Tinted
Knob	20C32-2	VHF Channel Selector
Knob	33C355-2	UHF Channel Selector
Knob	33C355-1	VHF Fine Tuning
Knob	33D231-29	UHF Fine Tuning
Knob	20C35-1	Off-On Volume
Knob	33C356-1	Brightness, Tone
Knob	20C31-1	Contrast, Vert. Hold
Cabinet	34E145-1	Models T22M10, T22UM10
Cabinet	34E145-2	Models T22M11, T22UM11
Cabinet	34E145-3	Models T22M12, T22UM12
Cabinet	34E145-4	Models T22M13, T22UM13
Cabinet	35E530-1	Models C22M11, C22UM11
Cabinet	35E530-2	Models C22M12, C22UM12
Cabinet	35E530-3	Models C22M13, C22UM13
Cabinet	35E531-2	Models C22M22, C22UM22
Cabinet	35E531-3	Models C22M23, C22UM23
Cabinet	35E531-4	Models C22M24, C22UM24
Cabinet	35E532-2	Models L22M22, L22UM22
Cabinet	35E532-3	Models L22M23, L22UM23
Cabinet	35E532-4	Models L22M24, L22UM24
Cabinet Leg	37D168-52	Models C22M12, C22UM12
Cabinet Leg	37D168-53	Models C22M13, C22UM13
Cabinet Leg	35E531-52	Models C22M22, C22UM22
Cabinet Leg	35E531-53	Models C22M23, C22UM23
Cabinet Leg	35E531-54	Models C22M24, C22UM24
Cabinet Leg	37D168-59-64	Models L22M22, L22UM22
Cabinet Leg	37D168-60-65	Models L22M23, L22UM23
Cabinet Leg	37D168-62-67	Models L22M24, L22UM24

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



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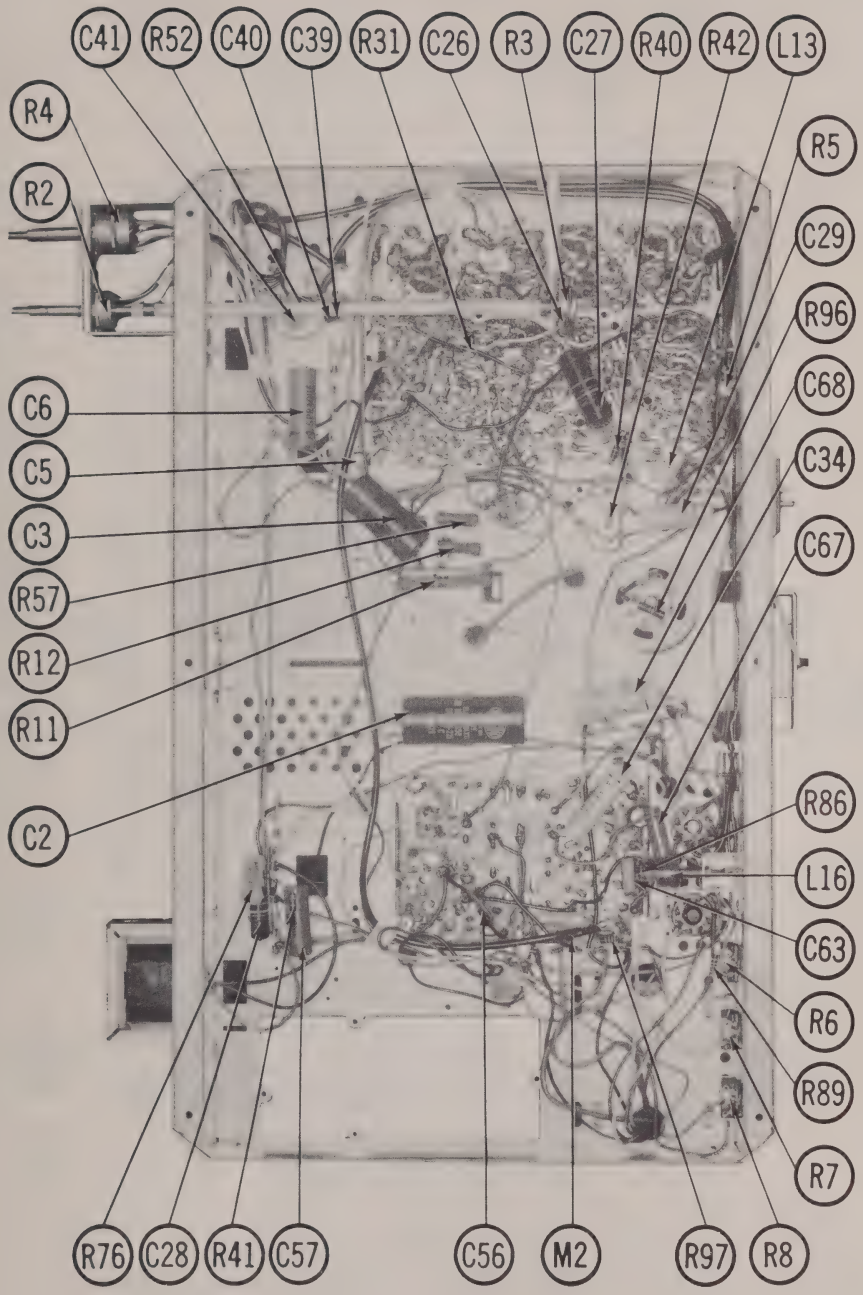
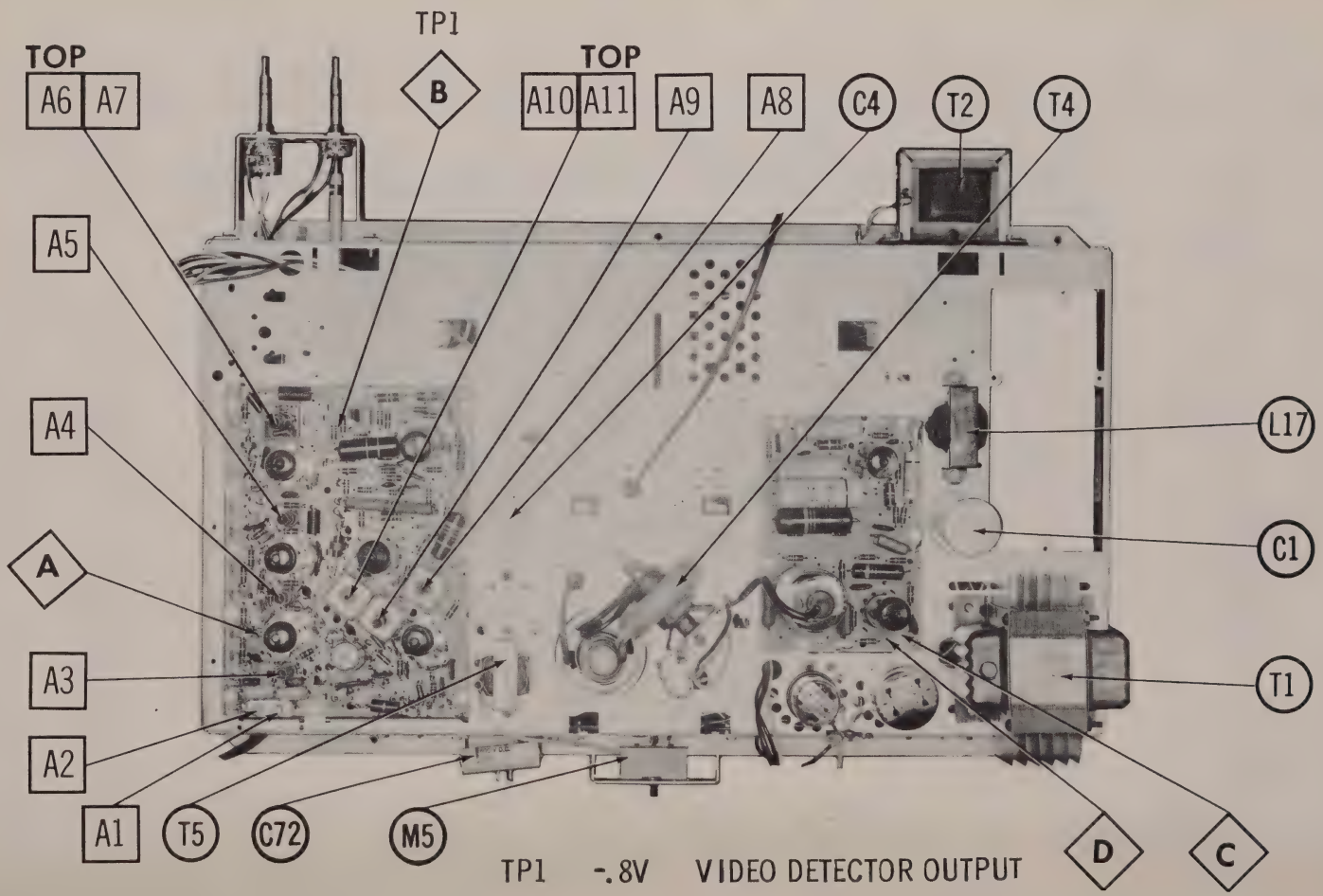
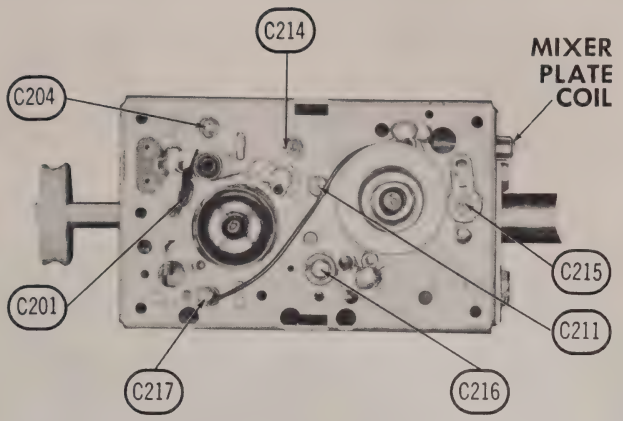
UHF TUNER 94D162-4



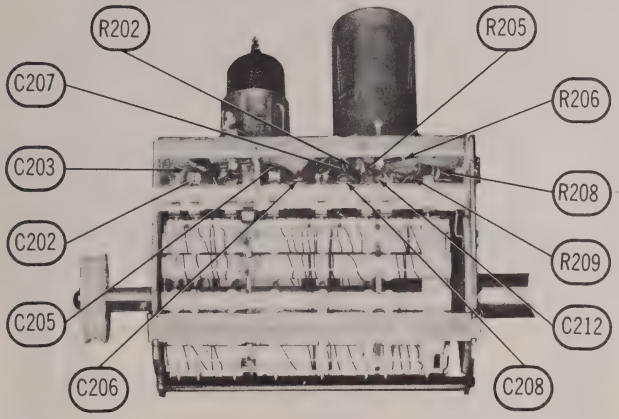
CHASSIS BOTTOM VIEW



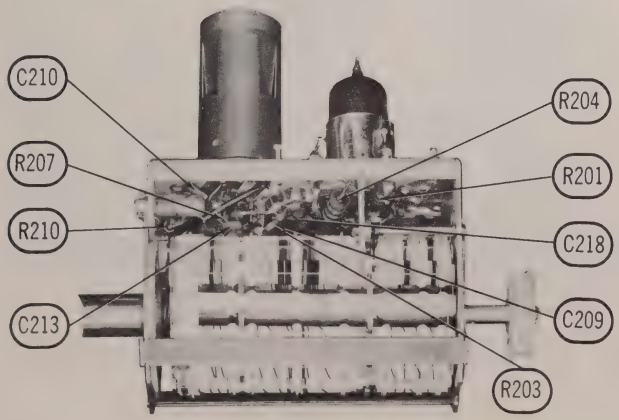
CHASSIS TOP VIEW



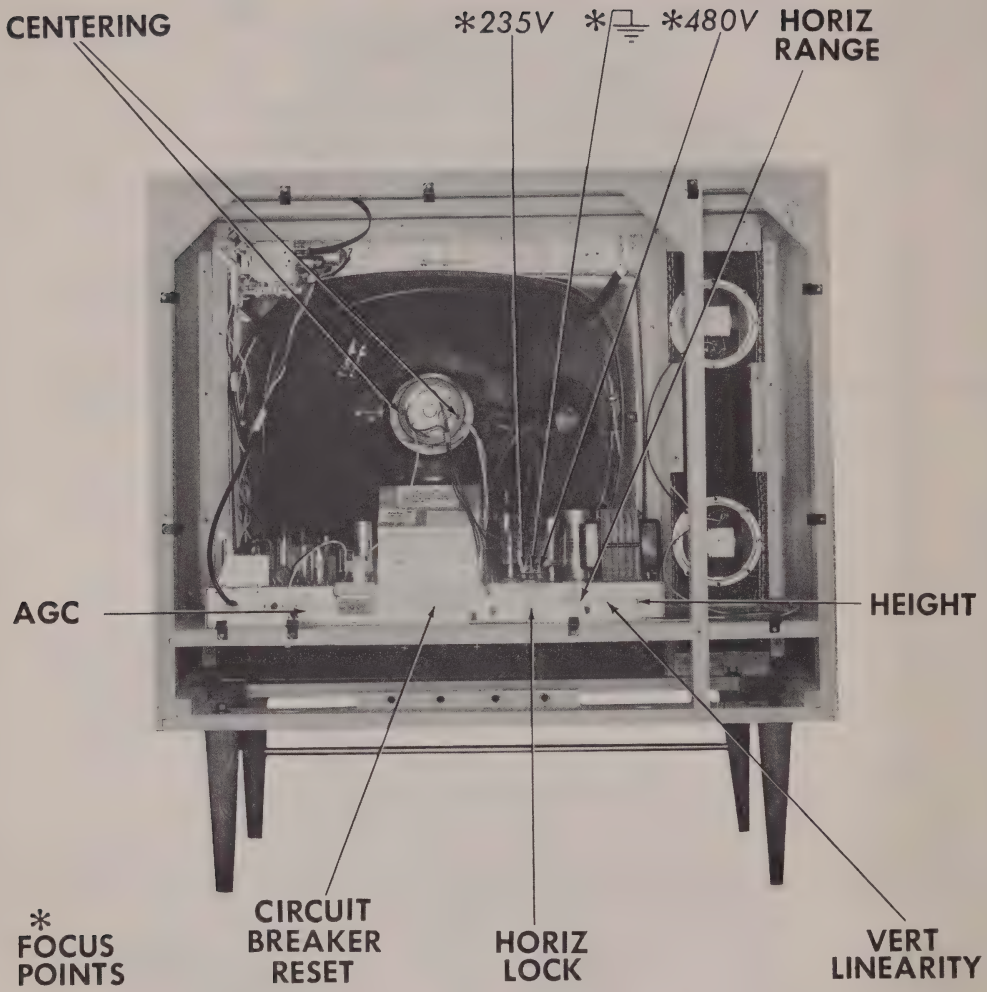
TUNER 94E163-4 - TOP VIEW



TUNER 94E163-4 - LEFT SIDE



TUNER 94E163-4 - RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from point Ⓒ to chassis. Connect a . 22mfd, 400 volt capacitor from point Ⓓ to chassis.

Adjust the Horizontal Range to the point where picture is almost stable horizontally.

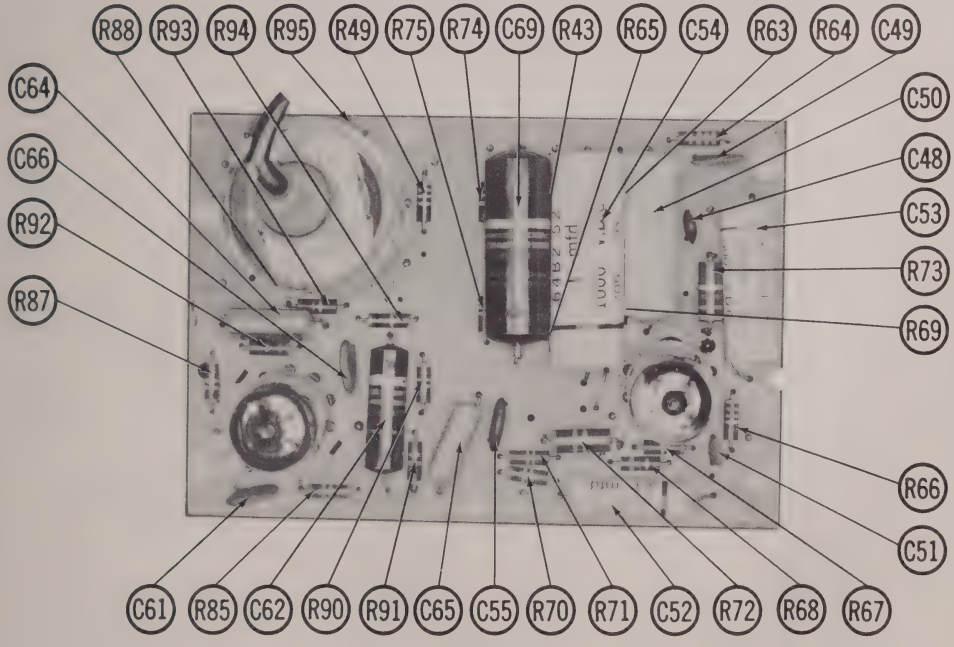
Remove the capacitor from point Ⓓ and adjust the Horizontal Lock to the point where the picture is almost stable horizontally.

Remove the clip lead from point Ⓒ and chassis. Adjust the Horizontal Lock until the picture is synchronized horizontally.

CircuiTrace Numbers 38 thru 55

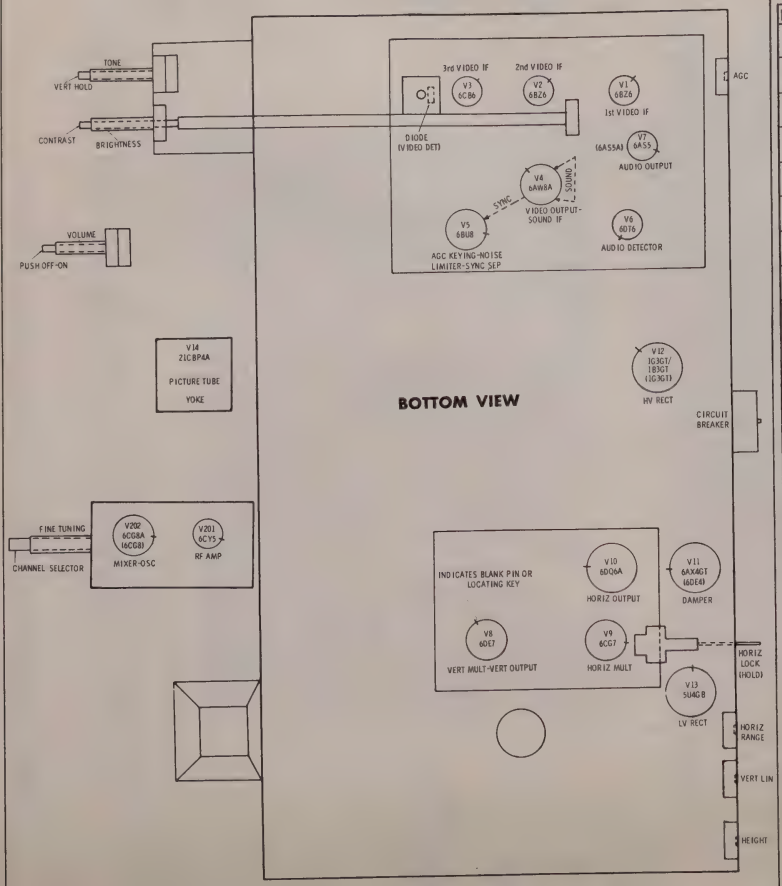
A Howard W. Sams CIRCUITRACE® Photo

SWEEP PRINTED BOARD



SWEEP PRINTED BOARD - CAPACITOR & RESISTOR IDENT.

TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▬ 470Ω	▬ 470Ω	0Ω		
V2	6BZ6	110K	▬ 68Ω	.1Ω	0Ω	† 470Ω	† 470Ω	130K		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	▪ 470Ω	▪ 470Ω	0Ω		
V4	6AW8A	0Ω	100K	▪ 50K	0Ω	.1Ω	0Ω	3400Ω	‡ 30K	‡ 5600Ω
V5	6BU8	▪ 0Ω	† 8200Ω	2.3meg	0Ω	.1Ω	† 30K	† 1meg	† 47K	† 12meg
V6	6DT6	16Ω	680Ω	.1Ω	0Ω	‡890K	▪ 8200Ω	560K		
V7	6AS5	¶	550K	0Ω	.1Ω	550K	† 220Ω	† 550Ω		
V8	6DE7	† 660Ω	1.5meg	1.5meg	.1Ω	0Ω	• ‡5.2meg	820K	• 180K	• 800Ω
V9	6CG7	† 10K	2.5meg	1100Ω	0Ω	.1Ω	† 82K	• 40K	1100Ω	0Ω
V10	6DQ6A	NC	0Ω	NC	† 15K	1meg	NC	.1Ω	0Ω	TOP CAP ‡14Ω
V11	6AX4GT	NC	NC	¶700K	NC	†0Ω	TP	.1Ω	0Ω	
V12	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡464Ω
V13	5U4GB	NC	¶	NC	22Ω	NC	24Ω	NC	¶	
V14	21CBP4A	.1Ω	39K	Pin 6 ‡100K	Pin 10 † 100K	Pin 11 • 100K	Pin 12 0Ω			
V201	6CY5	3.7meg	0Ω	.1Ω	0Ω	† 5600Ω	† 15K	0Ω		
V202	6CG8A	39K	▪ 24K	0Ω	.1Ω	0Ω	▪ 2800Ω	▪ 12K	0Ω	1meg
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

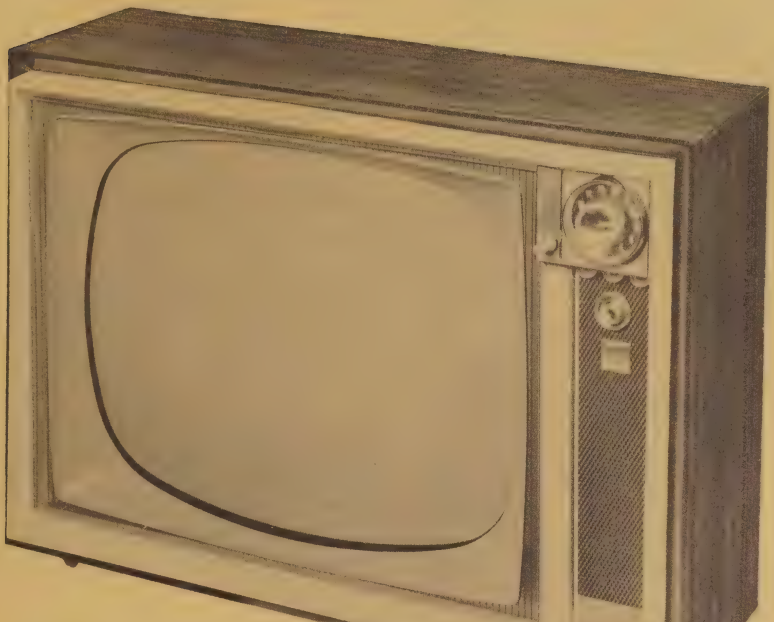
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 240V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.
▬ MEASURED FROM PIN 7 OF V2.
▪ MEASURED FROM 125V SOURCE.
NC NO CONNECTION.
TP TIE POINT.

FOLDER 2
SET 480

PHOTOFACT® Folder with CIRCUITRACE®

AIRLINE MODELS WG-4083, -4093, -41
-4193, -5083, -5093, -5183, -5193

AIRLINE MODELS WG-4083, -4093, -4183,
-4193, -5083, -5093, -5183, -5193



MODEL WG-4083

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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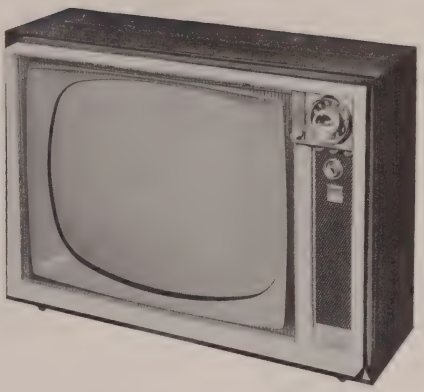
AIRLINE MODELS WG-4083, -4093, -4183, -4193, -5083, -5093, -5183, -5193

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL FOR MODEL WG-4083

1. Remove 11 wood screws holding rear cover. Remove the rear cover.
2. Remove 7 push-on type knobs from front of cabinet. Remove escutcheon around channel selector shaft by pulling straight out. Remove 1 push-on type station indicator.
3. Remove speaker leads, antenna leads and unclip the pilot lamp.
4. Remove 4 wood screws, 2 on each side, holding picture tube mounting bracket at the top.
5. Remove 1 tuner mounting bracket screw at upper left rear of cabinet.
6. Remove 4 chassis bolts holding chassis to metal guides at bottom of cabinet.
7. Remove chassis.



MODEL WG-4083

TRADE NAME	Airline MODELS WG-4083, WG-4093, WG-4183, WG-4193, WG-5083, WG-5093, WG-5183, WG-5193
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois.
TYPE SET	Television Receiver
TUBES	VHF-Seventeen, UHF-Eighteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 175 Watts, 1.85 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

FUSE DEVICE

A 4.5Ω fusible resistor is used for low voltage power supply protection. (For location, see Chassis-Top View.)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See "Disassembly Instructions".)

AGC

The AGC may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

SYNC STABILITY

Sync stability may be varied by means of a Sync Stabilizer control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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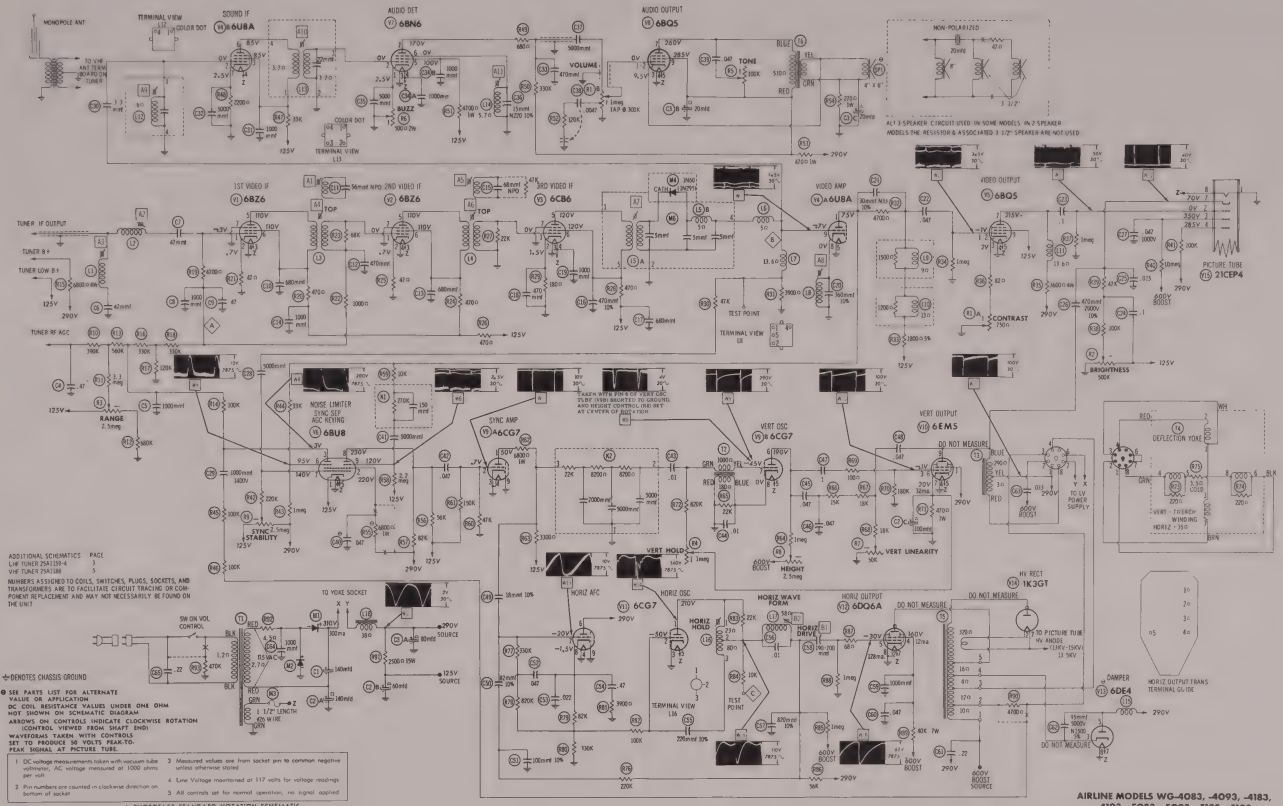
MONOPOLE ANT
TERMINAL VIEW
COLOR DOT
TO VHF ANT TERM BOARD ON TUNER
SOUND IF
W1 6U8A
AUDIO DET
V7 6BN6
AUDIO OUTPUT
V8 6BQ5
VOLUME
TONE
NON-POLARIZED
ALT 3-SPEAKER CIRCUIT USED IN SOME MODELS IN 2-SPEAKER MODELS THE RESISTOR & ASSOCIATED 3-1/2" SPEAKER ARE NOT USED
1ST VIDEO IF
V1 6BZ6
2ND VIDEO IF
V2 6BZ6
3RD VIDEO IF
V3 6CB6
VIDEO AMP
V4 6U8A
VIDEO OUTPUT
V5 6BQ5
PICTURE TUBE
V18 21CEP4
TUNER IF OUTPUT
TUNER B+
TUNER LOW B+
TUNER RF AGC
CONTRAST
BRIGHTNESS
RANGE
NOISE LIMITER
SYNC SEP
AGC KEYING
V9 6BU8
SYNC AMP
V10 6CG7
VERT OSC
V11 6CG7
VERT OUTPUT
V12 6EM5
DEFLECTION YOKE
VERT LINEARITY
HEIGHT
VERT HOLD
HORIZ AFC
HORIZ OSC
HORIZ WAVE FORM
HORIZ OUTPUT
V13 6DQ6A
HV RECT
V15 1K3GT
DAMPER
V13 6DE4
HORIZ OUTPUT TRANS TERMINAL GUIDE
TO PICTURE TUBE HV ANODE 11.5KV-15KV (1.5KV)
TO LV POWER SUPPLY
TO YOKE SOCKET
SW ON VOL CONTROL
DO NOT MEASURE
600V BOOST
600V BOOST SOURCE
125V SOURCE
290V SOURCE
ADDITIONAL SCHEMATICS PAGE
UHF TUNER 25A1339-4 3
VHF TUNER 25A1338 5
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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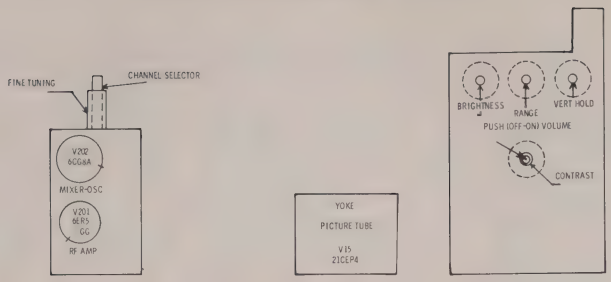
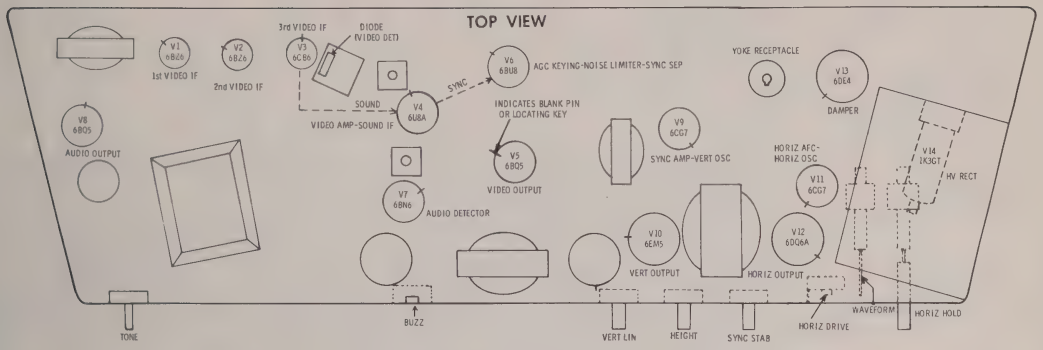
AIRLINE MODELS WG-4083, -4093, -4183, -4193, -5083, -5093, -5183, -5193

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

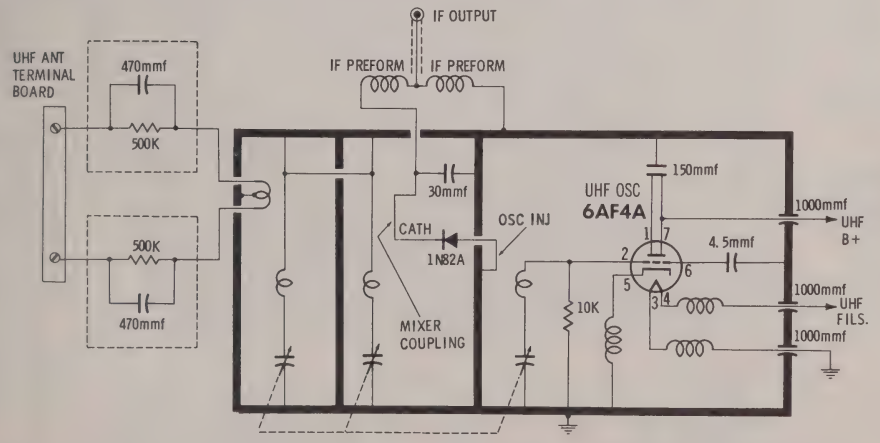
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rect. (B+)

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, Rect. (B+)
Vert. off freq. V9
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V15
Has pic, no sound V4, V7, V8
Overloaded picture V6

SYNC FAILURE
No vert. sync V6, V9
No horiz. sync V6, V9
No vert. or horiz. sync V6, V9



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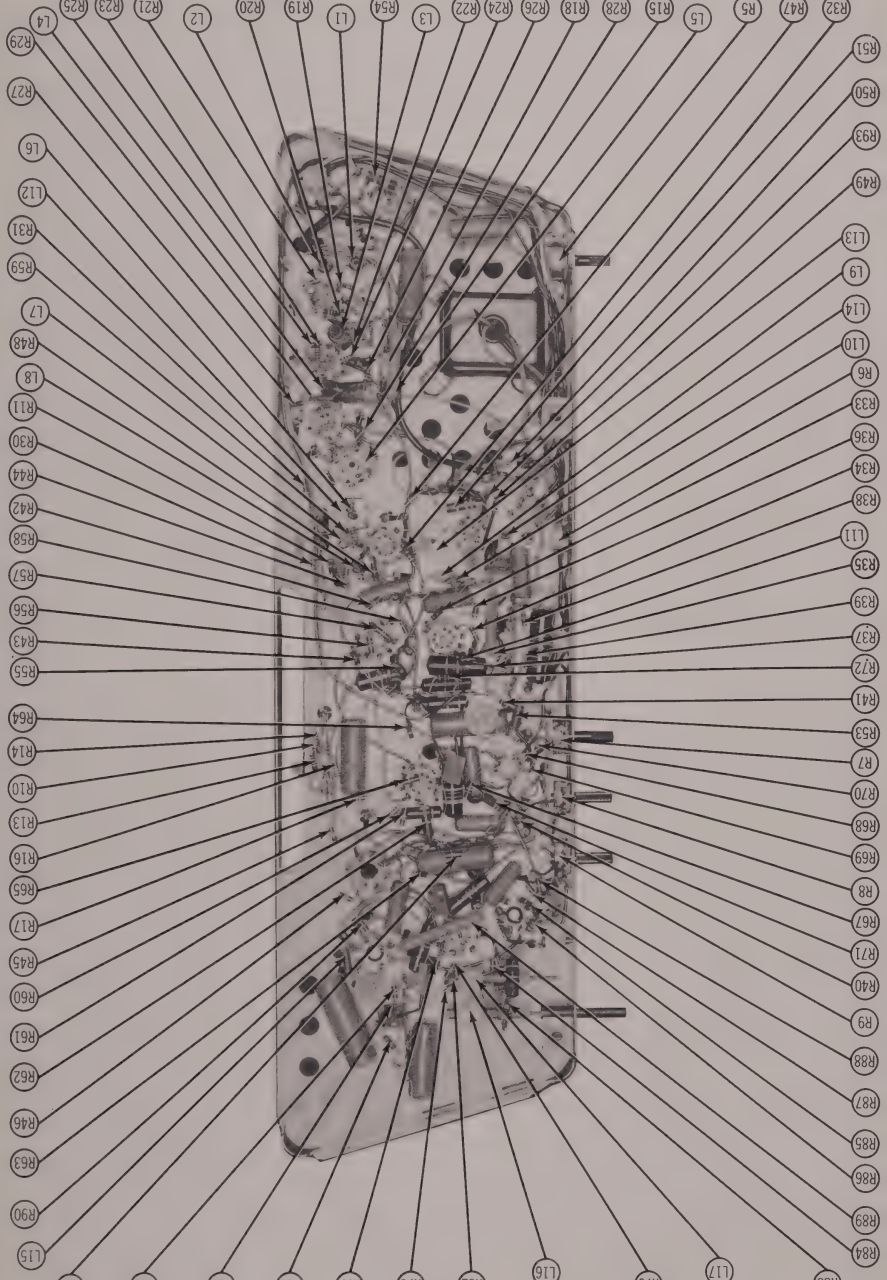
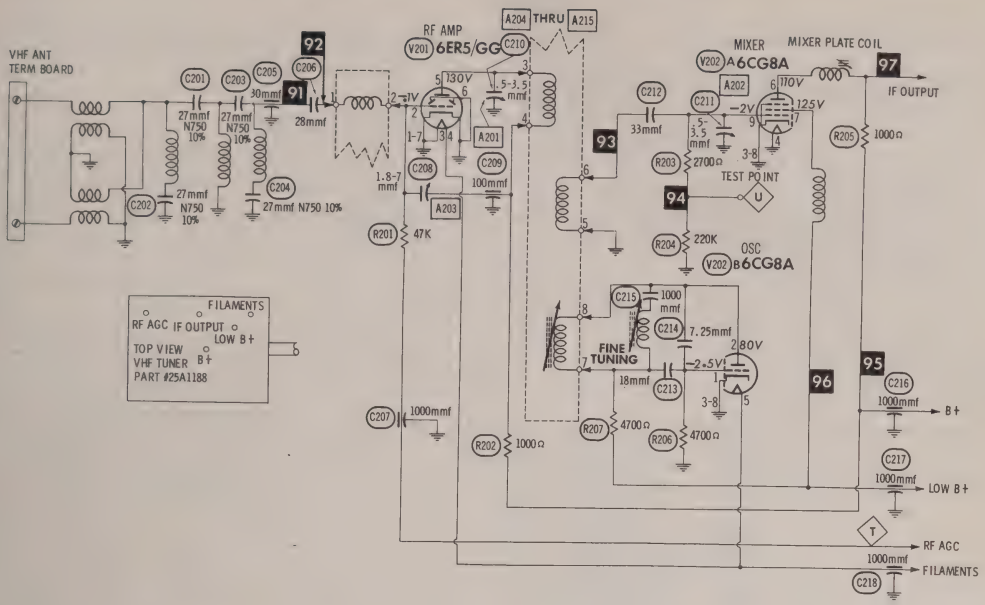
UHF TUNER 25A1159-4

SET 480 FOLDER 2

CHASSIS BOTTOM VIEW — RESISTOR & INDUCTOR IDENT.





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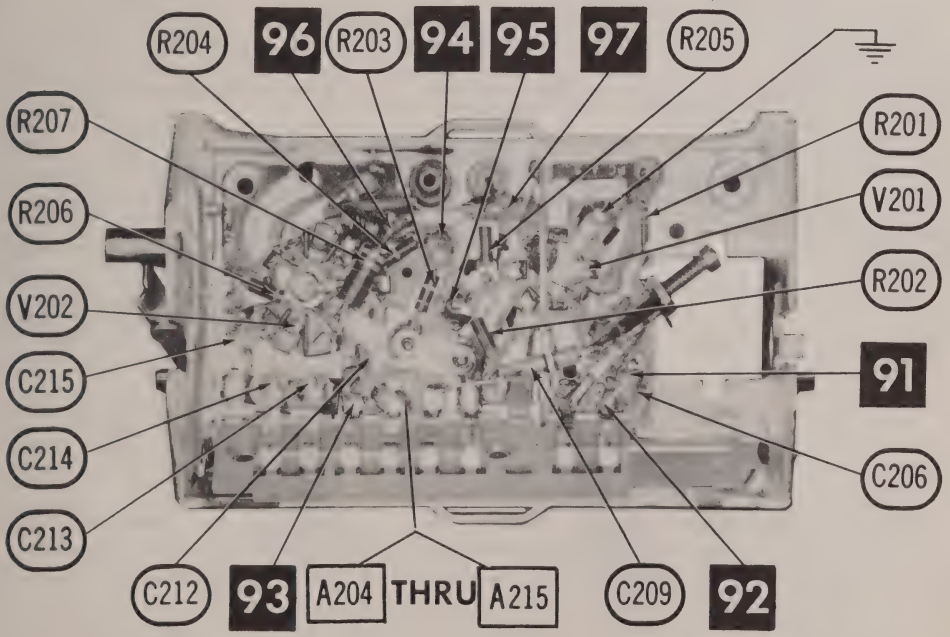
VHF TUNER 25A1188



A Howard W. Sams CIRCUITRACE® Photo

TUNER 25A1188 — BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS
25A1188

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8273, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A204 thru A215 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point ⓣ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Turn Contrast fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. to point ⓓ Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check to see that other channels have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

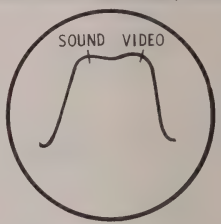


FIG. 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across Video Det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

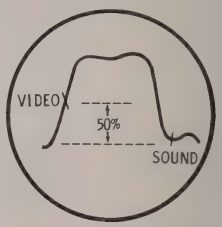


FIG. 202

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC 45.75MC 47.25MC	"	"	A2, A3, & Mixer Plate Coil	Adjust for response similar to Fig. 2. Mixer Plate Coil and A2 affect the shape of the top. A3 is adjusted to position the 41.25MC marker. This adjustment must be made correctly or the sound rejection will not be correct. The 45.75MC marker must be exactly on peak.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 10K to point (B). Low side to chassis. DC probe of VTVM thru 10K to same point. Common to chassis. (Across Video Det. load)	A4	Increase bias at point (A) to 4.5 volts. Adjust sweep output for -2 volts DC at point (B). Adjust A4 for maximum amplitude at marker.
4.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM amplitude at marker.
5.	"	"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.	"	"	"	44.0MC	"	"	A7	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch A2 thru A7 for desired response. A7 controls the symmetry of the top. A6 controls position of the 45.75MC marker. A4 controls position of the 42.4MC marker (this slug will seldom need retouching). CAUTION : The position of 44.5MC marker is very critical (98%).

4.5MC TRAP ALIGNMENT

Use 0-10 volts AC scale on VTVM.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 9 (grid) of 6U8 (V4). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV signal and reduce signal level at the antenna terminals, by use of an attenuator or similar device, until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10 and A11 for maximum undistorted sound.
Adjust the Buzz control for MINIMUM buzz.

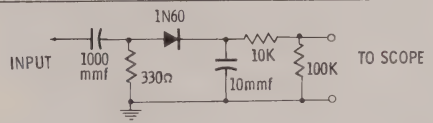


FIG. 1

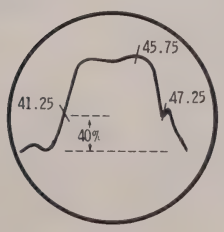


FIG. 2

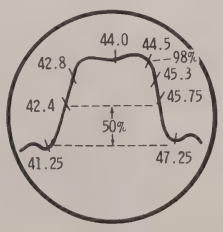


FIG. 3

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS • GENERAL ELECTRIC •		ITEM No.	RAYTHEON • SYLVANIA •	
	USE	TYPE		USE	TYPE
V1	1st Video IF Amp.	6BZ8	V8	Audio Output	6JA5
V2	2nd Video IF Amp.	6BZ6	V9	Sync Amp-Vert. Osc.	6CG7
V3	3rd Video IF Amp.	6CB6	V10	Vert. Output	6EM5
V4	Video Amp -Sound IF	6U8A	V11	Horiz. AFC-Horiz. Osc.	6CG7
V5	Video Output	6BQ5	V12	Horiz. Output	6DQ6A
V6	AGC Keying-Sync Sep-Noise Limiter	6BU8	V13	Damper	6DE4 * 1B3GT
V7	Audio Detector	6BN6	V14	HV Rect.	1B3GT

* Alternate 6DA4, recommended replacement 6DE4.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	AIRLINE PART No	GENERAL ELECTRIC PART No	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V15	21CEP4	21CEP4 ①	21CEP4 ①	21CEP4/ 21CEP4A ③	21CEP4/ 21CEP4A ③	① Aluminized ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	AIRLINE PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	140	150	45X431	AFH51-23	XAG251	FP11T	TMS-24	TVL-1429 TVL-2539 TVA-1422	
C2A	●40	150	45X464						
B	●80	350						TVL-2533 TVA-1305.5	
C3A	●80	350	45X465						
B	●20	350							
C	●20	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	REMARKS	REPLACEMENT DATA						
		AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	FILMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.47 300V	P288N-47		CUB2247	SDP-5-474	GEM-2047	2TM-P47	
C5	1000	BPD-001	DD-103	BYA1D1	CCD-102	GP310	5HK-D10	
C7	47	DS-470	DD-047	L05Q47	CCD-470	GP447	10TS-Q47	
C11	47	DS 47		L05Q47	CCD-470	GP447	10TS-Q47	
C12	1000	BPD-001	DD-103	BYA1D1	CCD-103	GP310	5HK-D10	
C9	.47 200V	P288N-47		CUB2247	SDP-5-474	GEM-2047	2TM-P47	
C10	680	BPD-00068	DD-681	BYA1T68	CCD-681	GP368	10TS-T68	
C11	56 NPO		TCZ-56	C05Q56C	CCTO-560	CNO-456	10TCC-Q56	
C12	470	BPD-00047	DD-471	BYA1T47	CCD-471	GP347	10TS-T47	
C13	680	BPD-00068	DD-681	BYA1T68	CCD-681	GP368	10TS-T68	
C14	1000	BPD-001	DD-103	BYA1D1	CCD-103	GP310	5HK-D10	
C15	68 NPO	NPO-D1 68	DTZ-68	C05Q68C	CCTO-680	CNO-468	10TCC-Q68	
C16	470 10%	DS-470	DS-471	BR8Y47	CCD-471	GP347	10TS-T47	
C17	680	BPD-00068	DD-681	BYA1T68	CCD-681	GP368	10TS-T68	
C18	470	BPD-00047	DD-471	BYA1T47	CCD-471	GP347	10TS-T47	
C19	1000	BPD-001	DD-103	BYA1D1	CCD-103	GP310	5HK-D10	
C20	360 1%	1469-00036	DD-361	ZBR3T36	CM-3VB-361F		MS-338	
C21	30 N33 10%	P488N-047	DD-503	CUB4047	SDP-5-473	GEM-4147	4TM-S47	#47X5S9
C22	.047 400V	P488N-047	DD-503	CUB4P1	SDP-5-394	GEM-401	4TM-P1	
C23	.1 400V	P488N-1	DP-104	CUB2P1	SDP-5-104	GEM-401	2TM-P1	
C25	.015 600V	P488N-015	DD16-153	CUB6S15	SDP-5-153	GEM-4115	4TM-S15	
C26	470 3000V 10%				VCM-15-471K			#47X771
C27	.047 1000V	P1088N-047	DD-503	CUB10447	SDP-5-473	GEM-10147	10TM-S47	
C28	5000	BPD-005	DD-503	BYA1D5	CCD-502	GP250	5HK-D50	
C29	1000 1600V	HVD-15-1000	DD5-102	HVYBD01	HVCCD-102		BL-D10	10TCC-V32
C30	3.3	NPO-H 3.3	TCZ-3R3	C05V33C	CCTO-3R3	CNO-333		
C31	1000	BPD-001	DD-103	BYA1D1	CCD-103	GP310	5HK-D10	
C32	5000	BPD-005	DD-502	BYA1D5	CCD-502	GP250	5HK-D50	
C33	470	BPD-00047	DD-471	BYA1T47	CCD-471	GP347	10TS-T47	
C34A	1000	BPD-X1001	DD3-102	BYTDED1	CCD-102	BXE310	5HK-XD10	
B	5000	BPD-005	DD-502	BYA1D5	CCD-502	GP250	5HK-D50	
C35	5000						10TCB-Q15	
C36	15 N220 10%							
C37	5000	BPD-005	DD-502	BYA1D5	CCD-502	GP250	5HK-D50	
C38	.0047 400V	P488N-0047	DS-472	CUB6D47	SDP-5-472	GEM-6347	6TM-D47	
C39	.0047 600V	P688N-047	DD-503	CUB6047	SDP-5-473	GEM-6147	6TM-S47	
C40	.047 400V	P488N-047	DD-503	CUB4047	SDP-5-473	GEM-6147	4TM-S47	Note 1
C41	.047 600V	BPD-005	DD-503	BYA1D5	CCD-502	GP250	5HK-D50	
C43	.047 400V	P488N-047	DD-503	CUB4047	SDP-5-473	GEM-6147	4TM-S47	
C43	.01 400V	P488N-01	DE-103	CUB4P1	SDP-5-104	GEM-401	4TM-P1	
C44	.01 400V	P488N-01	DE-103	CUB4S1	SDP-5-103	GEM-431	4TM-S1	
C45	.047 400V	P488N-047	DD-503	CUB4047	SDP-5-473	GEM-6147	4TM-S47	
C46	.047 400V	P688N-047	DD-503	CUB4047	SDP-5-473	GEM-6147	4TM-S47	
C47	.01 400V	P488N-1	DP-103	CUB4P1	SDP-5-104	GEM-401	4TM-P1	
C48	.047 600V	P688N-047	DD-503	CUB6S47	SDP-5-473	GEM-6147	6TM-S47	
C49	18 10%	1469-00018	DD-180	ZBR5S18	CM-5VB-180K	CNO-518	MS-418	
C50	82 10%	1469-00082	DD-820	ZBR5Q82	CM-5VB-820K	CNO-582	MS-482	
C51	100 10%	1469-0001	DD-101	ZBR5T1	CM-5VB-100K	MC5T10	MS-310	
C52	.047 200V	P288N-047	DD-503	CUB2S47	SDP-5-473	GEM-4147	2TM-S47	
C53	5000	P288N-022	DD-303	CUB4S23	SDP-5-232	GEM-3122	3TM-S22	
C54	.47 300V	P288N-47		CUB2247	SDP-5-474	GEM-2047	2TM-P47	
C55	220 10%	1469-00022	DD-221	ZBR5T22	CM-5VB-331K	CNO-322	MS-322	
C56	100 10%	1469-0001	DD-101	ZBR5T1	CM-5VB-101K	MC5T10	MS-310	
C57	820 10%	1469-00082	DD-821	ZBR5T82	CM-5VB-821K	MC8S31	MS-382	
C58	150-700				305			#17AZ76
C59	1000	BPD-001	DD-103	BYA1D1	CCD-102	GP310	5HK-D10	
C60	.047 400V	P488N-047	DD-503	CUB4047	SDP-5-473	GEM-6147	4TM-S47	
C61	.22 600V	P688N-22		CUB6P23	SDP-5-234	GEM-6023	6TM-P23	
C62	95 5000V NJ500 5%							#47X769
C63	.033 600V	P688N-033	DD-303	CUB6S33	SDP-5-333	GEM-6133	6TM-S33	
C64	5000	BPD-001	DD-502	BYA1D1	CCD-102	GP310	5HK-D10	
C65	.22 400V	P488N-22		CUB4P1	SDP-5-234	GEM-4023	4TM-P22	

#Airline Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	
R1A	750Ω	½	T8X32		RTV-649		UB124-8	Contrast
B	1meg				Not Req.			Volume
	300K Tap							
C	Switch				Not Req.			Push-Push Off-On
R2A	500K	½	40X447	AB-59	A47-500K-S	QJJ-133	U50	Brightness
B	Shaft			AK-9	RS-3/16	NQ	UB-37	
R3A	2 Meg	½	40X448	AB-83	B47-2.5meg§	QJJ-239	U285	Range
B	Shaft			AK-9	RS-3/16	NQ	UB-37	
R4A	1meg	½	40X446	AB-89	A47-1meg-S	QJJ-137	U54	Vert. Hold
B	Shaft			AK-9	RS-3/16	NQ	UB-37	
R5A	100K	½	40X468	AB-40	A47-100K-S	BJJ-128	PTA52L	Tone
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R6	500Ω	2(NOM)	40X472	WN-501	39-500	112-500	PS05-5	Buzz
R7A	50K	½	40X467	AB-31	B47-50K-S	BJJ-123	PTA54L	Vert. Linearity
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R8A	2 Meg	½	40X466	AB-83	B47-2.5meg§	BJJ-239	SU-585	Height
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R9A	2 Meg	½	40X466	AB-83	B47-2.5meg§	BJJ-239	SU-585	Sync. Stability
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	390K	
R11	5.3meg	
R12	680K	
R13	560K	
R14	100K	
R15	68000Ω 4W	#43X344
R16	330K	
R17	180K	
R18	330K	
R19	470Ω	
R20	470Ω	
R21	470Ω	
R22	1000Ω	
R23	56K	
R24	470Ω	
R25	470Ω	
R26	470Ω	
R27	22K	
R28	470Ω	
R29	180Ω	
R30	47K	
R31	33000	
R32	47000	
R33	18000Ω 5%	
R34	1meg	#43X331
R35	3800Ω 4W	
R36	82Ω	
R37	1meg	

ITEM No.	RATING	REMARKS
R38	100K	
R39	47K	
R40	10meg	
R41	100K	
R42	2200	
R43	1meg	
R44	33K	
R45	100K	
R46	100K	
R47	33K	
R48	2200Ω	
R49	680Ω	
R50	330K	
R51	47000 1W	
R52	190K	
R53	4700 1W	
R54	270Ω 1W	
R55	68000 1W	Note 1
R56	56K	
R57	33K	
R58	3.3meg	
R59	10K	
R60	47K	
R61	180K	
R62	68000 1W	
R63	33000	
R64	1meg	
R65	22K	

ITEM No.	RATING	REMARKS
R66	15K	
R67	18K	
R68	18K	
R69	100Ω	
R70	180K	
R71	470Ω 1W	
R72	330K	
R73	220Ω	
R74	220Ω	
R75	3.5Ω (Coil)	
R76	330K	
R77	330K	
R78	680K	
R79	82K	
R80	330K	
R81	39000	
R82	100K	
R83	33K	
R84	10K	
R85	1meg	
R86	56K	
R87	68Ω	
R88	1meg	
R89	40K 7W	#43X343
R90	4700Ω	
R91	25000 15W	#43X313
R92	4.5Ω	#43X398
R93	470K	

#Airline Part Number Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AIRLINE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	39MC Trap	9A3369		17-4524	17-4524	TV-131	4302	
L2	1st Video IF	9A3365		17-4535	17-4535		6221	VF-4
L3A	2nd Video IF	9A3363		17-4536	17-4536		6222	
B	47.25MC Trap							
L4A	3rd Video IF	9A3414		17-4533	17-4533		6221	
B	41.25MC Trap	*						
L5A	4th Video IF	*	†					
B	Series Peaking Coil			19-3036	19-3036	TV-180	6176	30uh
L6	Resonant Choke	9A3375						30uh
L7	Shunt Peaking Coil	39A3		19-3180	19-3180	TV-184	6180	180uh
L8	4.5MC Trap	9A3074		20-1004 ▲	20-1004 ▲	TV-191 ▲	1468 ▲	VF-3 ▲
L9	Shunt Peaking Coil	38A6		19-3075 ▲	19-3075 ▲	TV-181 ▲	6173 ▲	VF-2 ▲
L10	Shunt Peaking Coil	38A49		19-4263 ▲	19-4263 ▲	TV-197 ▲	6264 ▲	VF-5 ▲
L11	Shunt Peaking Coil	38A3		19-3180	19-3180	TV-184	6180	VF-5
L12	1st Sound IF	9A3434		17-3038	17-3038			
L13	2nd Sound IF	9A3365		17-3495	17-3495	TV-133	6303	VF-3
L14	Quadrature Coil	9A2267		20-1005	20-1005	TV-116	6203	
L15	RF Choke	9A2380		19-1001	19-1001	BC-562	6804	1.5uh

† Part of M6.
▲ Remove C30 (390mmf cap.)

▲ Parallel with 18000 resistor.
▲ Parallel with 18000 resistor.

① Wound on 1500Ω resistor.
② Wound on 1200Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L16	103Ω		8-38A1003	HS-7	TV-165	6213		HS-7	Horiz. Osc. Tapped ①
			18X30		*	*			80Ω Horiz. Osc. Extension control shaft
L17	58Ω		9A2372	HS-5*		6315		HS-5*	Horiz. Waveform

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA					
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT (000 "L)	AIRLINE PART No	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L18	.300A		1 Hy.	52X104	28C44				28C44	C-28X

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117V ▲ 105V ▲ 95V ▲	6.3V ▲ 9.6A		38X281					
	1.85A .900A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert Osc.	54X19	28A03	A-3003	V405	YBG19	A-8125	28A03	A-97X
T3	Vert. Output	51X209			V319				A-140X
T4	Yoke-Horiz (15.2MHz (210^{H})-Vert. (144Hz)	9A2453 ①	Y-52 ②		V-110	2.3	DY-37A	2①Y-52 ②	Y-85 & NW-23 ②
	Yoke Assembly	9A2454 ④							YC-110
	Rear Cover & Centering Device	2A498							
	Yoke Clamp	30X539							D-183*
T5	Horiz. Output	53X262							

① Does not include rear cover and centering device.
② Connect same as original.
③ Use original yoke damping network.
④ Includes rear cover and centering device.

* CONNECTION DATA

ORIGINAL	1	5	4	3	2	1
TRIAD	1	2	3	4	5	6

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	8300Ω	3-4Ω	51X308	24S81 ①	A-3026	AU-601 ②	A-3850 ①	24S81 ①	S-33X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	AIRLINE PART No.	QUAM PART No.	
SP1	4" x 6" PM 8" PM 3½" PM		3-4Ω	12AS31 ① 12AT3 ② 12AS74 ③	46A15	① Table Models ② Console Models

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	Sync Sep. Grid	150mmf, 270K		
K2	Vert. Integrator	3000mmf, 5000mmf, 5000mmf, 6300Ω, 8300Ω, 22K	76X7	Aerovox PA-501 Centralab PC100 Mallory MS-100 Sprague V1/V3

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	AIRLINE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.300A	56X23	SD-500	HF504	40K	SR500	Silicon Type
M2	.300A	56X23	SD-500	HF504	40K	SR500	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	1¼"	Length of 426 Wire						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1N60 1N295*		1N60	1N60	1N60	Video Det. (Pigtail) * Alternate.

AIRLINE MODELS WG-4083, -4093, -4183, -4193, -5083, -5093, -5183, -5193

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Tuner	25A1188	VHF
	Tuner	25A1159-4	UHF
M6	4th Video IF Assy.	9A2370	

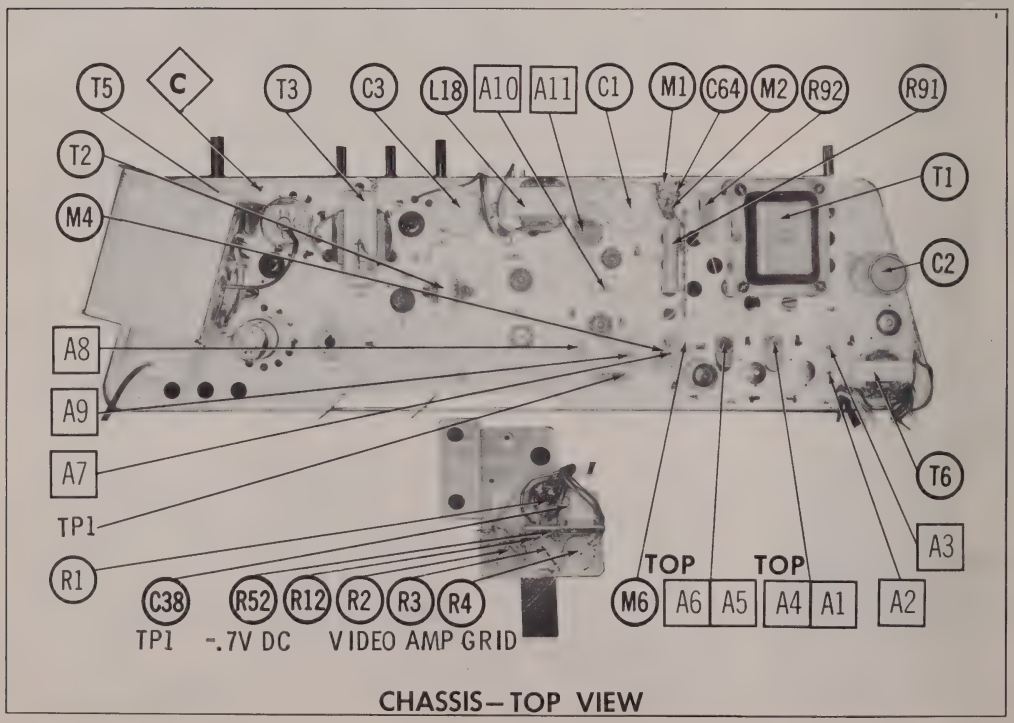
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	17X202-3	Tinted
Knob	10A985-1	Channel Selector
Knob	10A987-1	Fine Tuning
Knob	10A933-1	Contrast
Knob	10A932-1	On-Off Volume
Knob	10A894-2	UHF Indicator
Knob	10A893-2	UHF Tuning
Dial	26A656	Includes dial escutcheon assembly
Pointer	10A984-1	Channel Indicating

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CHASSIS—TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

25A1188

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V201	RF Amp.	6ER5/GG	V202	Mixer-Osc.	6CG8A		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30							
C206	28			TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7.0			829-7				
C209	100							
C210	.5-3.5							
C211	.5-3.5							
C212	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C213	18		NPO-DI 20	TCZ-20	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C214	7.25				C10V7C			10TS-V75
C215	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

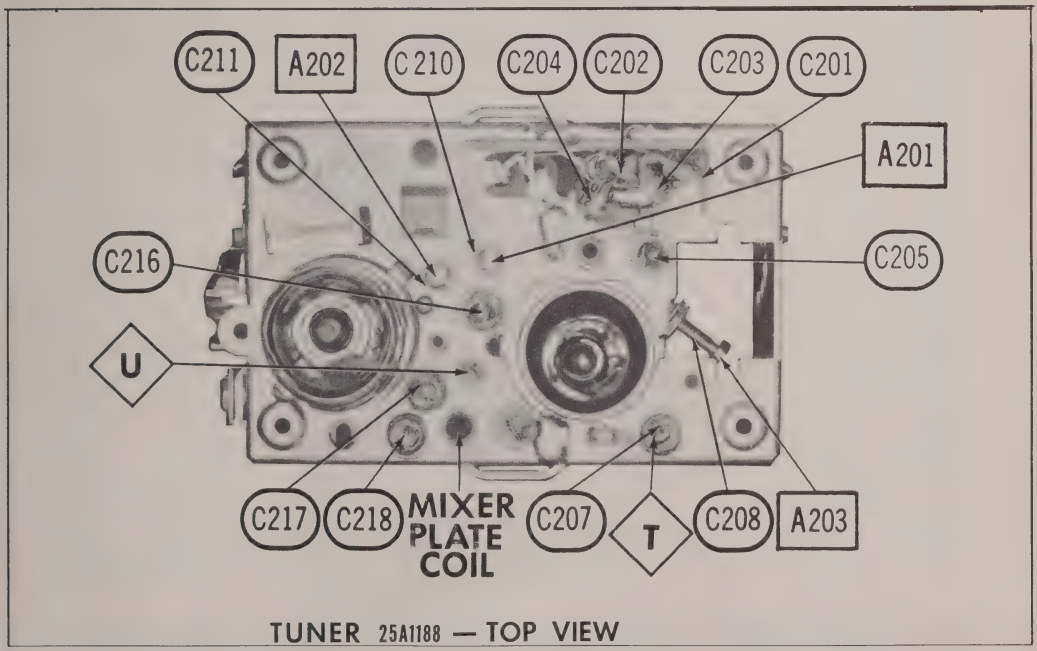
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1000Ω	
R203	2700Ω	

ITEM No.	RATING	REMARKS
R204	220K	
R205	1000Ω	
R206	4700Ω	

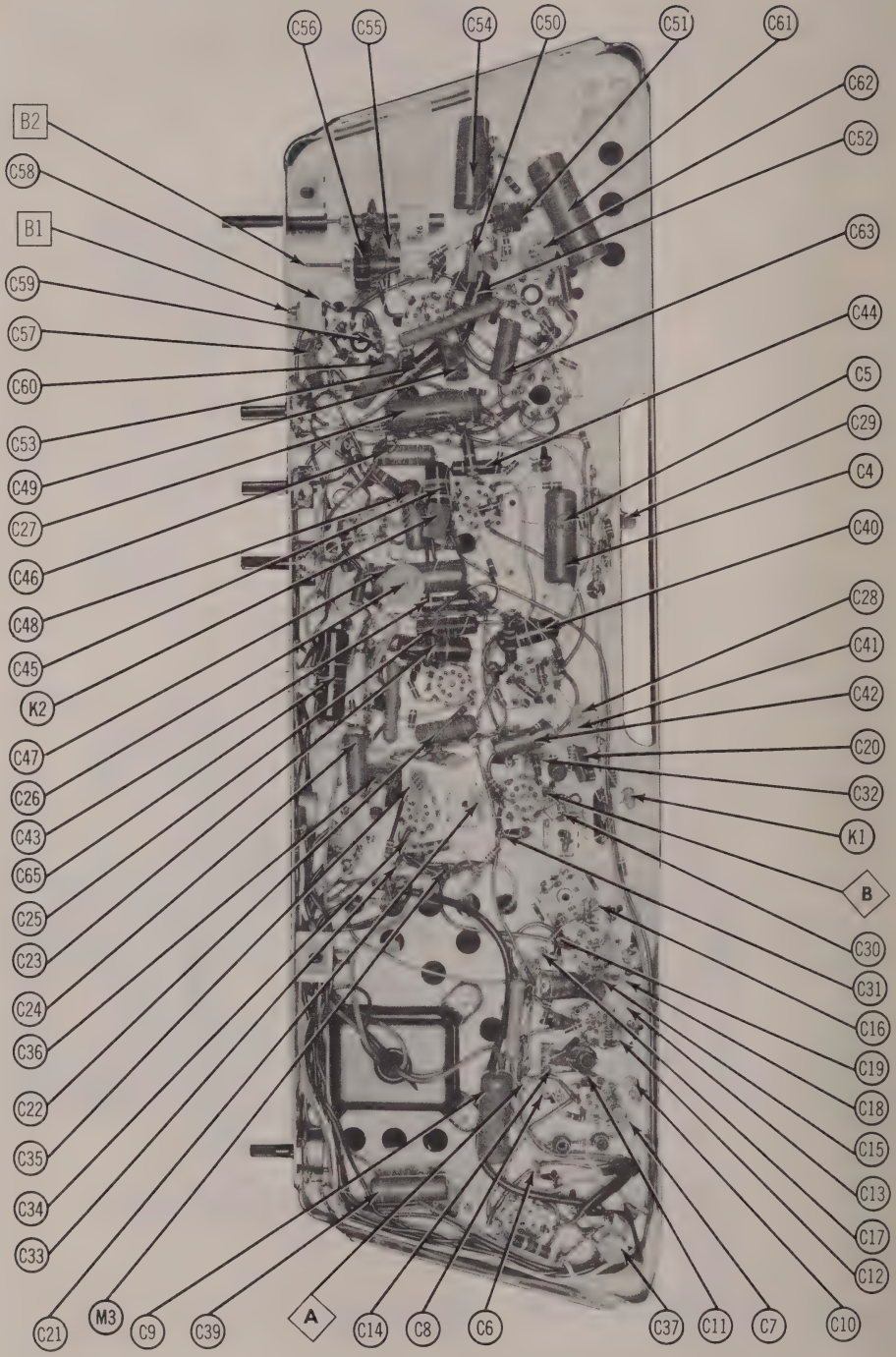
ITEM No.	RATING	REMARKS
R207	4700Ω	



TUNER 25A1188 — TOP VIEW

AIRLINE MODELS WG-4083, -4093, -4183, -4193, -5083, -5093, -5183, -5193

FOLDER 2



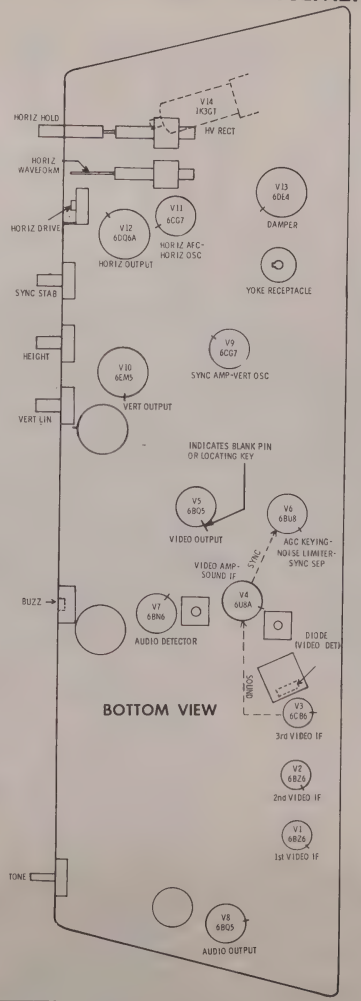
CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

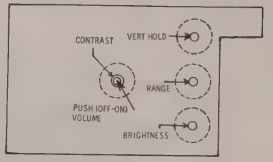
RESISTANCE MEASUREMENTS

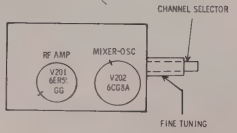
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	450K	47Ω	.1Ω	0Ω	†3500Ω	†3500Ω	0Ω		
V2	6BZ6	450K	47Ω	.1Ω	0Ω	†3500Ω	†3500Ω	0Ω		
V3	6CB6	.2Ω	180Ω	0Ω	.1Ω	†3000Ω	†3000Ω	0Ω		
V4	6U8A	†6000Ω	6Ω	†35K	.1Ω	0Ω	†35K	2200Ω	.3Ω	3900Ω
V5	6BQ5	1meg	1meg	• 200Ω	0Ω	.1Ω	NC	†3600Ω	NC	†2500Ω
V6	6BU8	†2500Ω	†6800Ω	550K	0Ω	.5Ω	†42K	•†900K	†35K	†2.2meg
V7	6BN6	• 320Ω	3.7Ω	0Ω	.1Ω	†7200Ω	5.7Ω	†330K		
V8	6BQ5	0Ω	0Ω	270Ω	0Ω	.1Ω	NC	†980Ω	NC	†470Ω
V9	6CG7	†13K	40K	0Ω	0Ω	.1Ω	•†1.8meg	•1.4meg	180Ω	0Ω
V10	6EM5	†0Ω	TP	180K	0Ω	.1Ω	180K	470Ω	TP	†290Ω
V11	6CG7	†56K	430K	0Ω	0Ω	.1Ω	†0Ω	1.5meg	410K	0Ω
V12	6DQ6A	TP	0Ω	TP	†40K	1meg	TP	.1Ω	0Ω	TOP CAP †16Ω
V13	6DE4	TP	TP	¶1.2meg	NC	†.2Ω	TP	.1Ω	0Ω	
V14	1K3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP 336Ω
V15	21CEP4	0Ω	1meg	†10meg	†100K	NC	NC	• 200K	.1Ω	
V201	6ER5/GG	0Ω	1.3meg	0Ω	.1Ω	†7800Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†7200Ω	0Ω	0Ω	.1Ω	†7800Ω	†2500Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

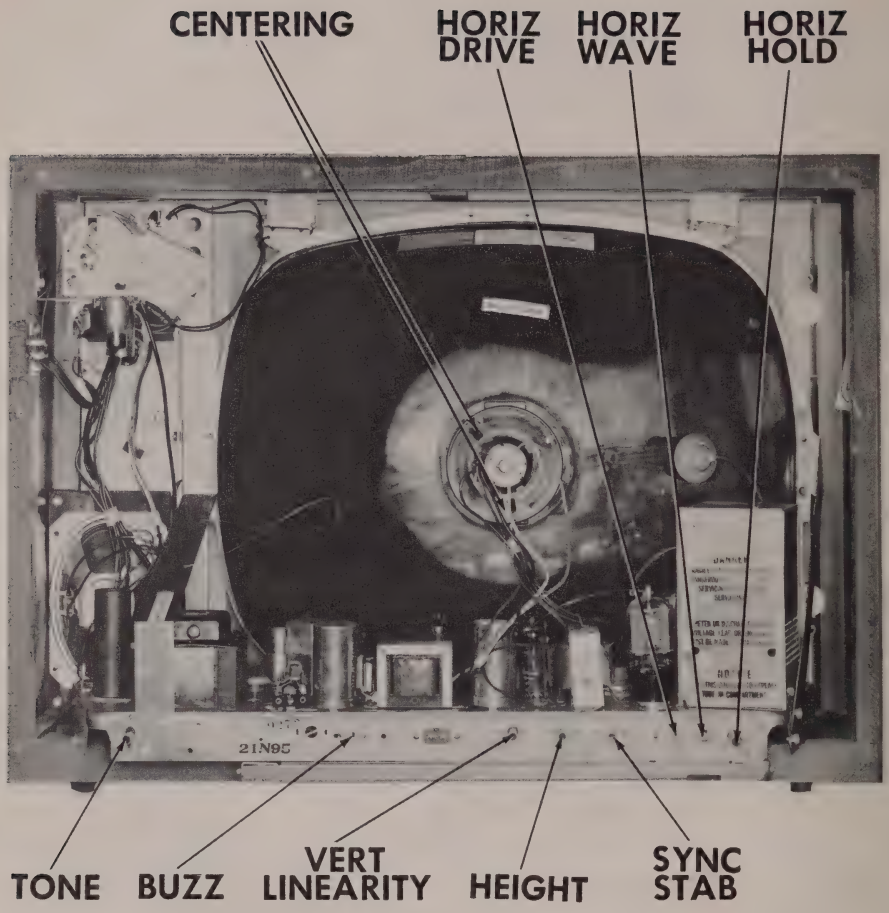
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 290V SOURCE.
† MEASURED FROM PIN 3 OF V13.
NC NO CONNECTION.
TP TIE POINT.

TUBE PLACEMENT CHART









CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a station and adjust the Horizontal Hold until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast control fully counterclockwise and Brightness control clockwise so that the picture appears washed out. Turn the Horizontal Drive trimmer (B1) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the Vertical Amplifier of the scope to point Ⓒ. Low side to chassis. Adjust the Horizontal Waveform slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. (See Fig. 4). Keep the picture in sync during this adjustment.

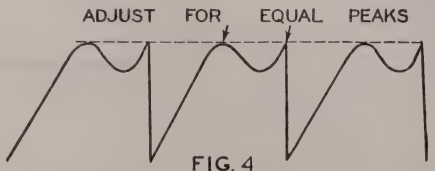


FIG. 4

PHOTOFACT® Folder

PRODUCTION CHANGE BULLETIN 235

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 419

EMERSON MODELS 1402, 1403 (CH. 120424N, W, 120425P, Y)

Emerson Models 1452 and 1453 (Ch. 120424W, 120425Y) were covered in PHOTOFACT Folder 2 - Set 419.

Models 1402 and 1403 (Ch. 120424N, W, 120425P, Y) are added, along with late production changes, with the publication of this bulletin.

The following changes apply to printed circuit board chassis coded Ⓔ.

TO IMPROVE VIDEO RESPONSE

A 750uh peaking coil (Part #708357) is added between R32 and 240 voltage source.

R46 is increased from 1.5meg to 2.2meg.

A 3.3meg ½ watt resistor is added in parallel with C24.

R30 is decreased from 82Ω to 47Ω.

R28 is increased from 6800Ω to 8200Ω.

C27 is decreased from 75mmf to 33mmf.

C29 is increased from 4700mmf to 10000mmf.

TO IMPROVE HORIZONTAL SWEEP

R72 is decreased from 1meg to 680K.

The following change applies to printed board chassis coded Ⓖ.

TO IMPROVE SOUND RESPONSE

R39 is decreased from 560Ω to 470Ω.

(Continued on Reverse Side)

PRODUCTION CHANGE
BULLETIN 235

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 310

GE MODELS 14T007, 14T008, 14T009, 14T010, 14T011, 14T012, 14T014 (CH. M)

General Electric Models 14T007, 14T008, 14T009, 14T010, 14T011, 14T012, 14T014 (Ch. M) were covered in PHOTOFACT Folder 4 - Set 310.

The following changes were made during late production.

COMPONENT CHANGE

C65 is increased from 2000mmf to 5000mmf.

R81 is decreased from 680Ω to 470Ω.

R84 is increased from 53Ω to 56Ω.

SOUND IF CIRCUIT CHANGED

V6A is changed from a 5AN8 to a 3AU6. With this change, a new circuit is used. A partial schematic showing the new circuit is given in this bulletin on the reverse side.

SET 480 FOLDER 3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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The following change applies to Power Chassis coded Ⓐ .

TO ELIMINATE SNIVETS

A 1000mmf @ 1000V ceramic disc capacitor is added from pin 1 of T4, Horizontal Output transformer, to ground.

The following change applies to Power Chassis coded Ⓑ .

TO INCREASE WIDTH

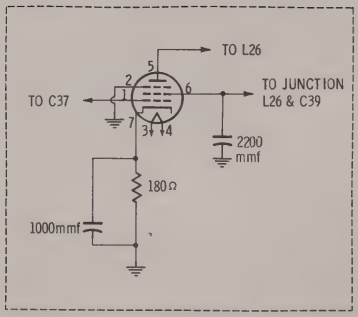
The jumper wire is removed from R75. A 3300Ω $\frac{1}{2}$ watt resistor is then added in parallel with R75.

COMPONENT CHANGE

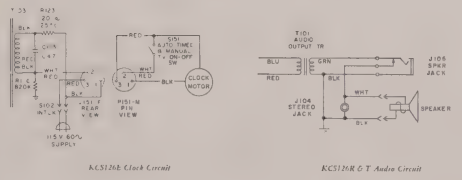
T1, Power Transformer, is changed to Part #730085. When this transformer is used 2 fusible links $2\frac{1}{2}$" long cut from #26 bare wire are used. The part number of this wire is #580308.

ALTERNATE VHF TUNER

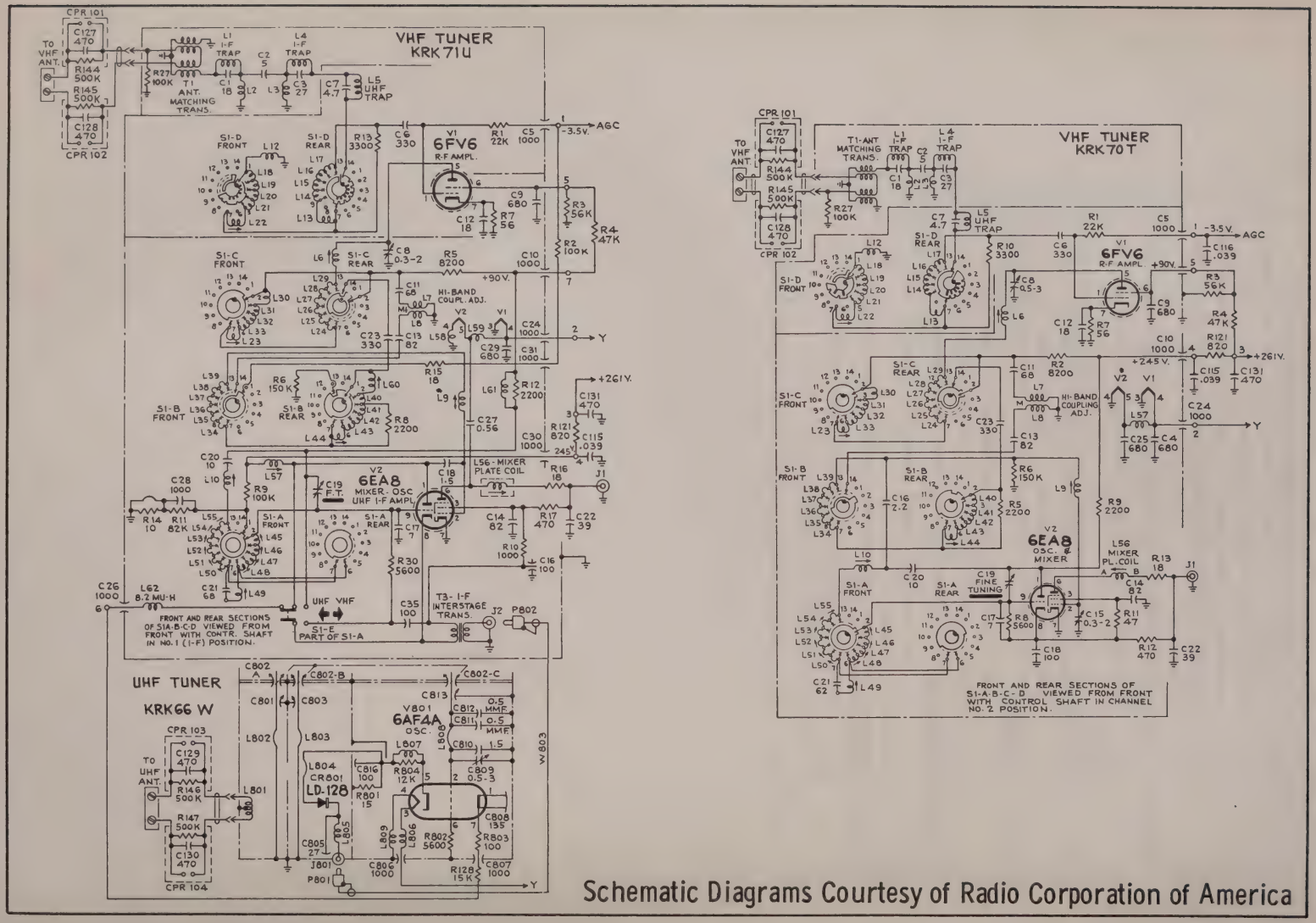
Some models 1402 and 1452 use VHF Tuner #471112. A schematic of this tuner may be found on page 14 of PHOTOFACT Folder 2 - Set 420.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 457	
	RCA Victor Models 170P048, U, 170P049, U, 170P060, U, 170P061, U, 170P063, U, 170P064, U (Ch. KCS126A, B) were covered in PHOTOFACT Folder 1 - Set 457. Models 170P069J, JU, 170PR106, 170PR109, 170T122, 170T123, 170T124, U, 170TC094, 170TR114, 170TR115 (Ch. KCS126E, F, J, R, T, YAA, YAB) are covered along with late production changes with the publication of this bulletin.
Ch. KCS126E	CIRCUIT ADDED An automatic clock timer circuit is added. A partial schematic of this timer is given in this bulletin.
Ch. KCS126F, J	COMPONENT CHANGE The Power Transformer (T1) is changed from Part #107233 to Part #107473.
Ch. KCS126R, T	CIRCUIT ADDED A stereo jack and a speaker jack is added to the Audio Output Circuit. A partial schematic showing the new circuit is given below in this bulletin.
Ch. KCS126YAA	TUNER CHANGE Ch. KCS126YAA uses VHF Tuner KRK70T. A schematic diagram of this tuner is given in this bulletin on the reverse side.
Ch. KCS126YAB	TUNER CHANGE Ch. KCS126YAB uses UHF Tuner KRK66W, VHF Tuner KRK71U. A schematic diagram of the tuner used is given in this bulletin on the reverse side.



Partial Schematic Diagrams Courtesy of Radio Corporation of America

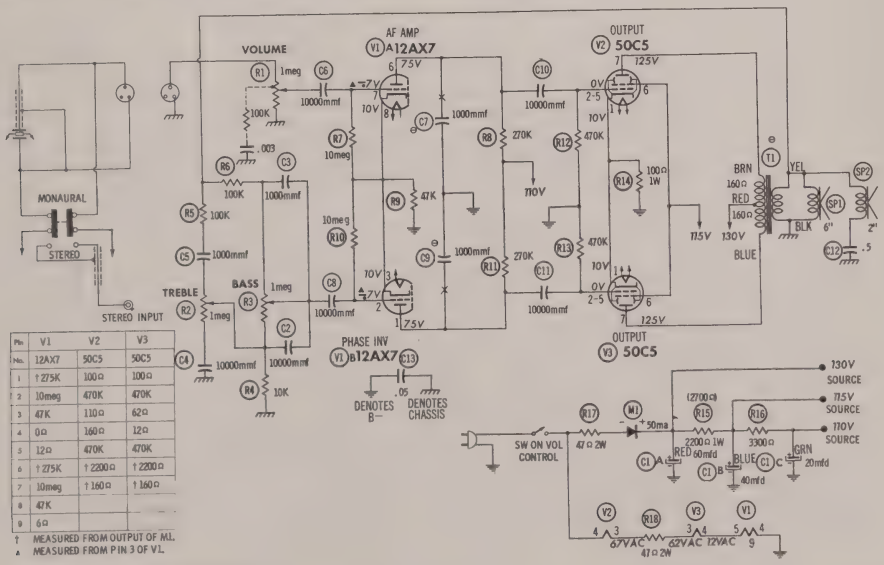


Schematic Diagrams Courtesy of Radio Corporation of America

PHOTOFACT® Folder

COLUMBIA
MODEL AX120

TRADE NAME	Columbia	MODEL AX120	
MANUFACTURER	CBS Electronics, 100 Endicott St., Danvers, Mass.		
TYPE SET	AC Operated 3 Tube Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING 30 Watts, .33 Amp. @ 117 Volts AC	



Pin No.	V1 12AX7	V2 50C5	V3 50C5
1	↑275K	100Ω	100Ω
↑ 2	10meg	470K	470K
3	47K	110Ω	62Ω
4	0Ω	160Ω	12Ω
5	12Ω	470K	470K
6	↑275K	↑2200Ω	↑2200Ω
7	10meg	↑160Ω	↑160Ω
8	47K		
9	6Ω		

↑ MEASURED FROM OUTPUT OF M.L.
▲ MEASURED FROM PIN 3 OF V.L.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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COLUMBIA
MODEL AX120

COLUMBIA
MODEL AX120

SET 480 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amp.-Phase Inv.	12AX7	V3	Output	50C5
V2	Output	50C5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	11B743	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX Part No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C3	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.5 200V		P288N-5		CUB2P2	2DP-5-504	GEM-205	2TM-P5
C13	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	VC-288	B-70-S	A47-1meg-Z	QI3-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	1meg	½	9B610	B-70	A47-1meg-Z	QI3-137	U53	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	9B610	B-70	A47-1meg-Z	QI3-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	10K	
R5	100K	
R6	100K	
R7	10meg	
R8	270K	

ITEM No.	RATING	REMARKS
R9	47K	
R10	10meg	
R11	270K	
R12	470K	
R13	470K	

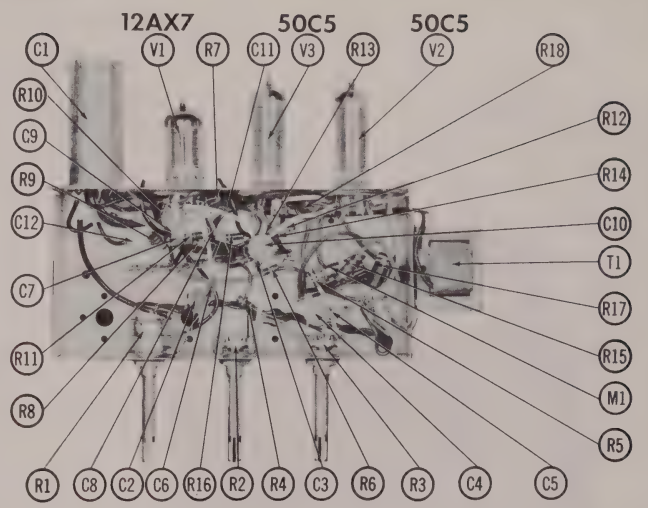
ITEM No.	RATING	REMARKS
R14	100Ω 1W	
R15	2200Ω 1W	(2700Ω)*
R16	3300Ω	
R17	47Ω 2W	
R18	47Ω 2W	

* Alternate value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4300Ω CT	3-4Ω	TR-165	22S86	A-2900	AU-608	A-3856	22S86	S-51X	① Alt. Part No.
		SEC.1								
	4200Ω CT	3-4Ω	3B212 ①							
		SEC. 2								
		30Ω								

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	1B108	6A21	
SP2	2"	MAGNETIC EARPHONE 1B142				

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.050A	10B614 ①	5E4 ①	H F154 ①	M150 ①	SR200 ①	① Silicon Type.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B498	Off-On-Volume, Treble, Bass
Cabinet	17B819	Tan & White
Cabinet	17B818	Red & Grey
Cabinet	17B817	Brown & Tan
Cabinet	17B816	Grey & Black

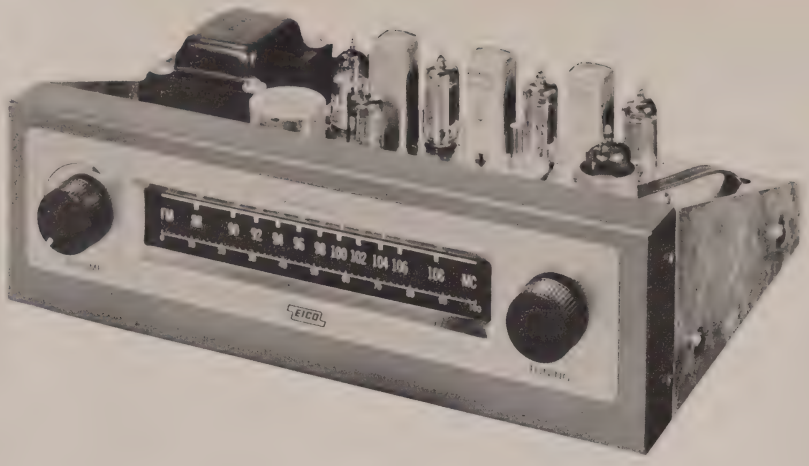
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

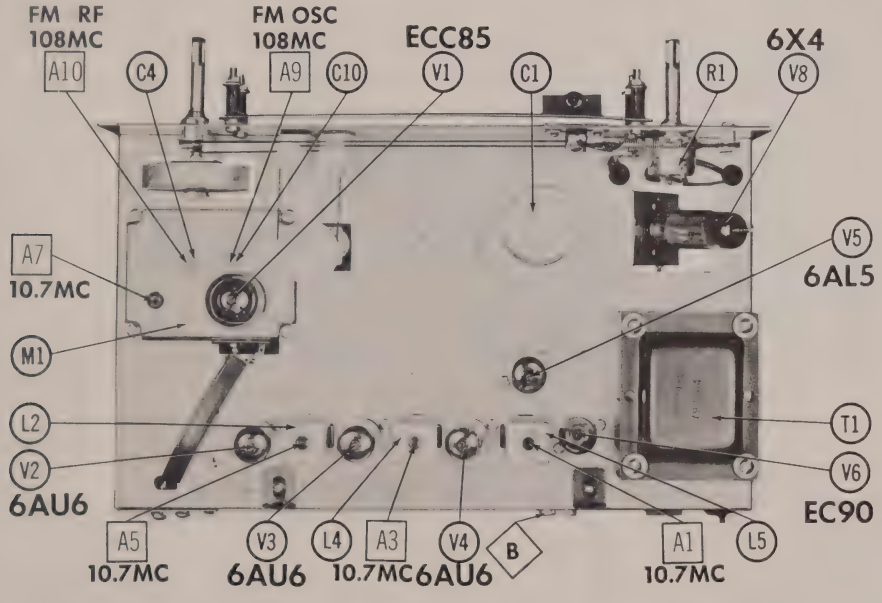
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

EICO MODEL HFT-90



TRADE NAME	Eico Model HFT-90
MANUFACTURER	Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N. Y.
TYPE SET	AC Operated 8 Tube FM Tuner
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
TUNING RANGE—FREQ. MOD.	88 — 108MC RATING 32 Watts, .3 Amp. @117 Volts AC



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JJ625

EICO MODEL HFT-90
EICO MODEL HFT-90
SET 480 FOLDER 5

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amp. -Conv.	ECC85
V2	1st IF Amplifier	6AU6
V3	2nd IF Amplifier	6AU6
V4	3rd IF Amplifier	6AU6
V5	Ratio Detector	6AL5
V6	Cathode Follower	EC90/6C4
V7	Tuning Indicator	DM70
V8	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	EICO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	24010	AFH4-04	D0032			TVLS-3639.16*	
B	■20	350							
C	▲20	250							
C2	10	25	23001	XPP-25010	NLW10-25	TT50X10	ML10-25	TE-1204	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10 N750 ±1mmf		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C4	2-20							
C5	1000		SI 1000	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C6	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C7	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C8	8.2 P100 ±1mmf							
C9	68 N750 5%		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C10	2-6			829-6		VC-3 *	CT552	
C11	10 N470 ±1mmf							
C12	15 NPO 10%		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C13	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0
C14	1000		SI 1000	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C15	25 10%		NPO-DI 25	DD-250	L10Q25	CCD-250	GP425	10TS-Q25
C16	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C17	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0
C18	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C19	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C20	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0
C21	47 10%		DI-47	DD-47	L10Q47	CCD-470	GP447	10TS-Q47
C22	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C23	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C24	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0
C25	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C26	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C27	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C28	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C29	.05 400V 10%		V84C4S5-10%		PM4S5	4DP-3-503	GEM-1615	4TM-S5
C30	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0
C31	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C32	10000 10%		DI-10000		PM6SI	CCD-103		10TS-SI0

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	EICO * PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	18044	B-51	A47-250K-Z	Q13-130	U44	Volume
B	Shaft			Not Req.	KS3-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	10K 1W	
R4	10K 1W	
R5	470K	
R6	470K	
R7	1200Ω 1W	
R8	100Ω	
R9	1200Ω 1W	
R10	100Ω	

ITEM No.	RATING	REMARKS
R11	470K	
R12	100K	
R13	15K 1W	
R14	15K 1W	
R15	68Ω	
R16	1000Ω	
R17	6800Ω	
R18	1500Ω	
R19	6800Ω	

ITEM No.	RATING	REMARKS
R20	68K	
R21	1meg	
R22	4700Ω	
R23	47K 1W	
R24	1800Ω 5W	
R25	500Ω 5W	
R26	220Ω 5% 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA EICO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Fil. Choke	35024						1, 2uh
L2	2nd IF Trans.	34600	16-3487	16-3487	FM-254	1463		
L3	RF Choke	35025	19-1002	19-1002	BC-563	4606		2, 2uh
L4	3rd IF Trans.	34601	16-3487	16-3487	FM-254	1463		
L5	Ratio Detector	34602	17-3498	17-3498	FM-255	1465		
L6	Fil. Choke	35024			BC-561			1, 2uh

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	EICO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .3A	420 VCT @ .040A	6.3V@ 2.6A	30024	24R11			PM8418	24R11	

MISCELLANEOUS

ITEM No.	PART NAME	EICO PART No.	NOTES
M1	FM Tuner	37001	

CABINETS & CABINET PARTS

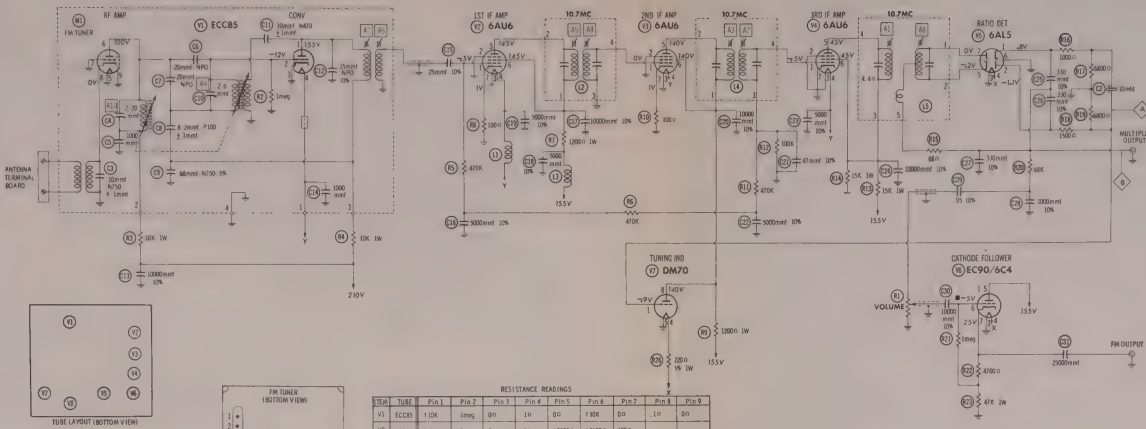
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	53007	(With dot) Off-On Volume
Knob	53019	Tuning

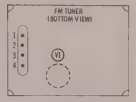
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



TUBE LAYOUT (BOTTOM VIEW)

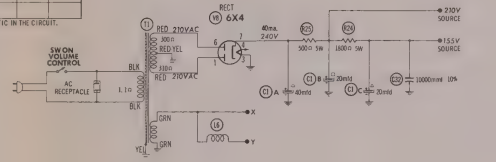


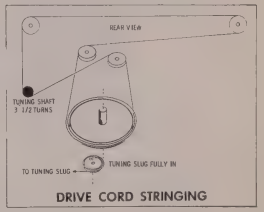
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†10K	1meg	0Ω	1Ω	0Ω	†10K	0Ω	1Ω	0Ω
V2	6AU6	1.5meg	0Ω	0Ω	1Ω	†3500Ω	*†3500Ω	100Ω		
V3	6AU6	.8Ω	0Ω	0Ω	1Ω	†3500Ω	*†3500Ω	100Ω		
V4	6AU6	100K	0Ω	0Ω	1Ω	†17K	*†17K	0Ω		
V5	6AL5	7800Ω	8300Ω	0Ω	1Ω	INF	0Ω	INF		
V6	EC90	†2900Ω	NC	0Ω	1Ω	†2300Ω	1meg	52K		
V7	DM70	6800Ω	NC	NC	1Ω	0Ω	NC	NC	†3500Ω	
V8	6X4	310Ω	NC	0Ω	1Ω	NC	300Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
* MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.





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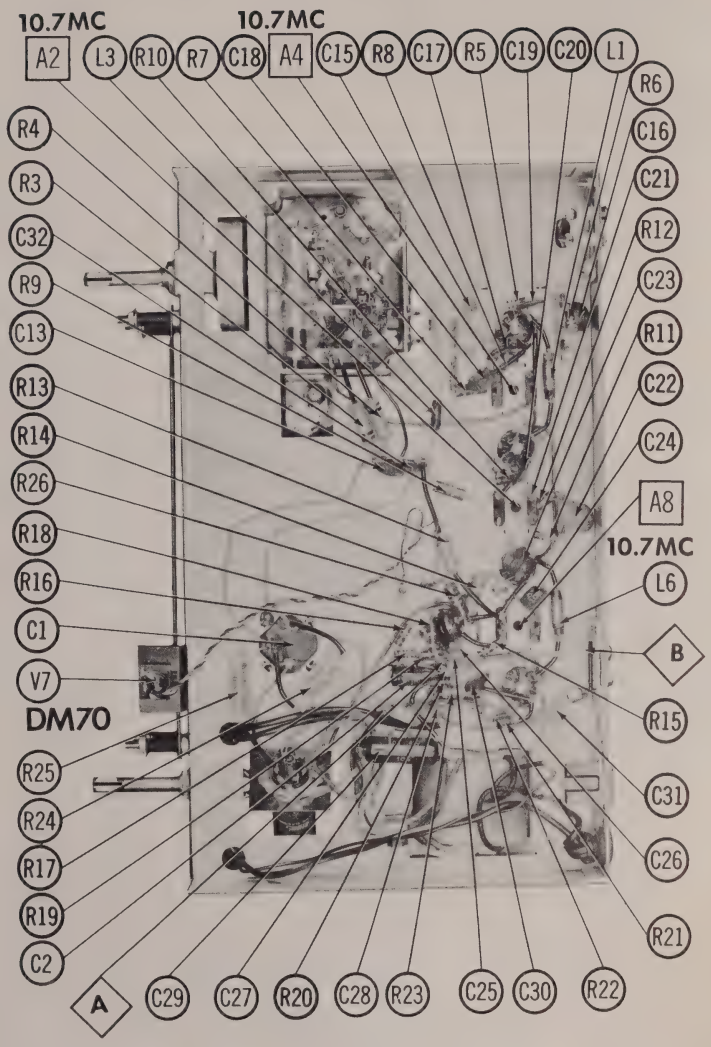
EICO MODEL
HFT-90



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A5, A8.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A6, A7.....	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544
A9, A10.....	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru 5mmf to pin 2 (grid) of Converter. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for maximum deflection.
2.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

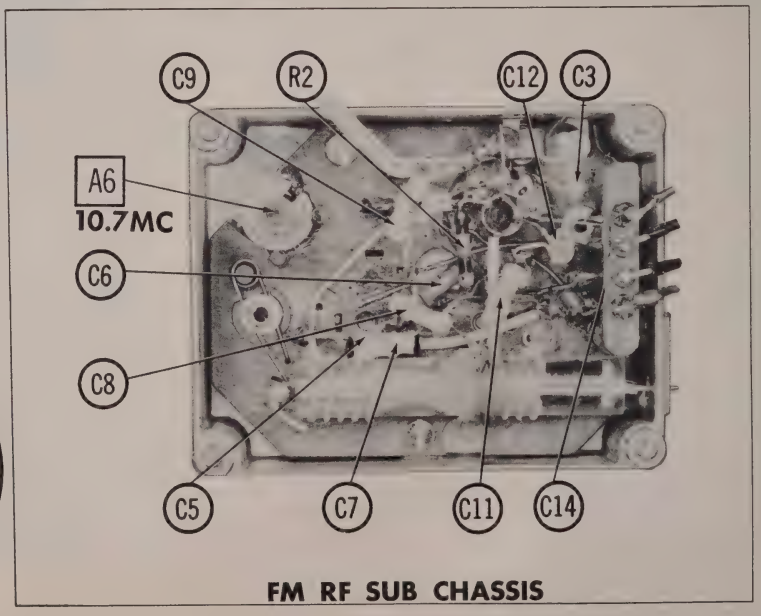
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru 5mmf to pin 2 (grid) of Converter. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5, A6, A7	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
2.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A8	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	108MC (Unmod.)	108MC	DC probe to point Ⓐ. Common to chassis.	A9, A10	Adjust for maximum deflection.

FIG. 1

FIG. 2



FM RF SUB CHASSIS

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODELS C430A, C431A

GENERAL ELECTRIC
MODELS C430A, C431A

MODEL C430A

GENERAL ELECTRIC
MODELS C430A, C431A

TRADE NAME	General Electric Models C430A, C431A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N. Y.
TYPE SET	AC Operated 5 Tube AM Receiver With Electric Clock
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles
RATING	27 Watts, .27 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 — 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	"	1500KC	Tune to 1500KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY

1. Remove volume, tuning, timer and Time-Set knobs.
2. Remove 5 screws from cabinet back; 4 screws from cabinet bottom.
3. Remove 4 Phillips screws. Remove Timer.
4. Unsolder speaker leads.
5. Remove chassis and timer.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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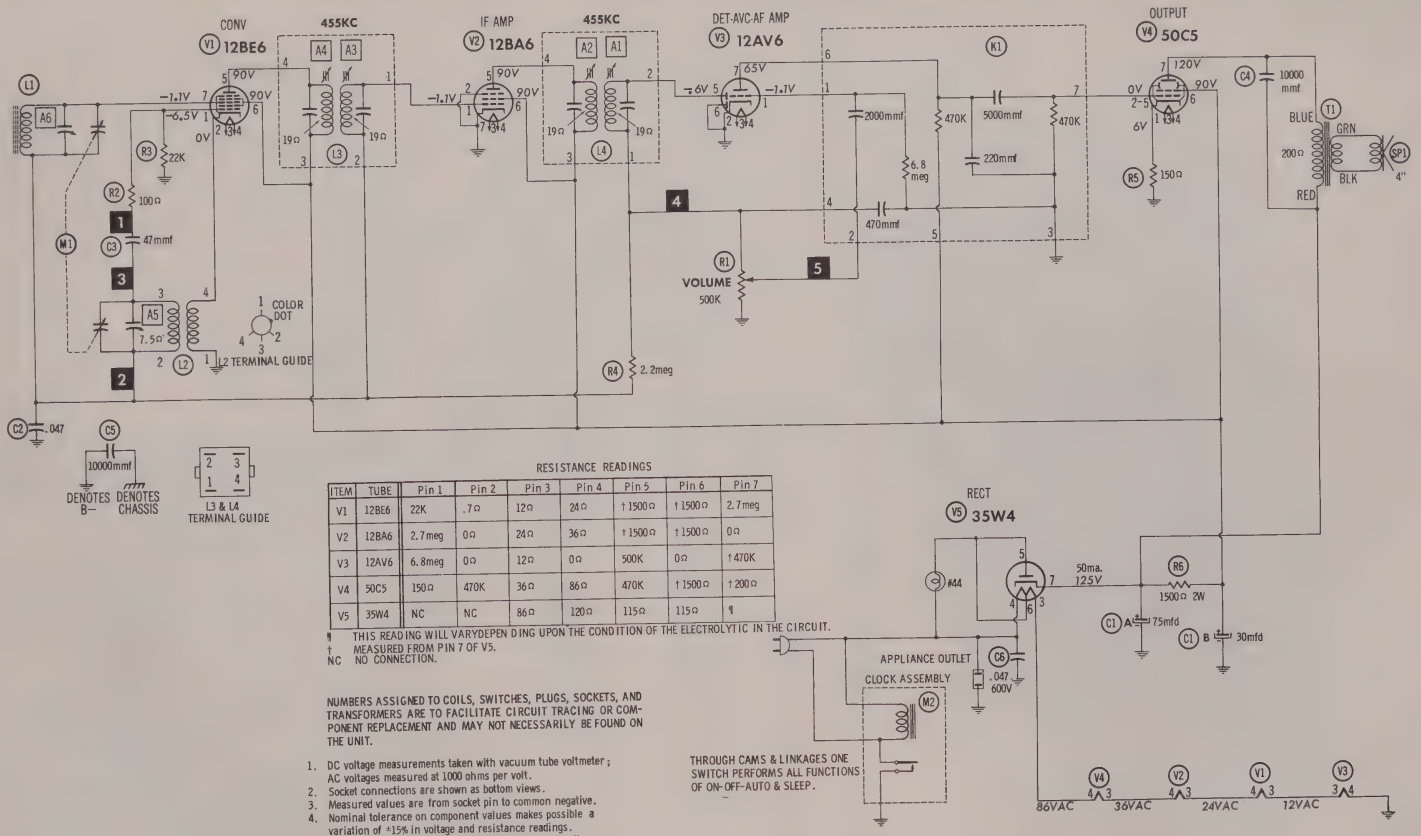
JG6l7

SET 480 FOLDER 6



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	12Ω	24Ω	†1500Ω	†1500Ω	2.7meg
V2	12BA6	2.7meg	0Ω	24Ω	36Ω	†1500Ω	†1500Ω	0Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1500Ω	†200Ω
V5	35W4	NC	NC	86Ω	120Ω	115Ω	115Ω	¶

¶ THIS READING WILL VARYDEPEN DING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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GENERAL ELECTRIC
MODELS C430A, C431A

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det. -AVC-AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G.E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	75	150	RS-2151	PRS2230	BBRD8415	WD220	TDLD-10	TVA-2460	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C3	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G.E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	RS-2150	B-60	A47-1meg-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	100Ω	
R3	22K	

ITEM No.	RATING	REMARKS
R4	2.2meg	
R5	150Ω	

ITEM No.	RATING	REMARKS
R6	1500Ω 2W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G.E. PART No.	REPLACEMENT DATA
K1	Det. - Audio Coupling	220mmf, 400mmf, 2000mmf, 5000mmf, (2) 470K, 6.8meg	RS-2045	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		G.E. PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	RS-1481			BC-419			
L2	Osc. Coil	RS-1479						
L3	Input IF	RS-2149	16-6780	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	RS-2149	16-6780	16-6780	BC-357	13-PC10	RF-4	

PRINTED BOARD

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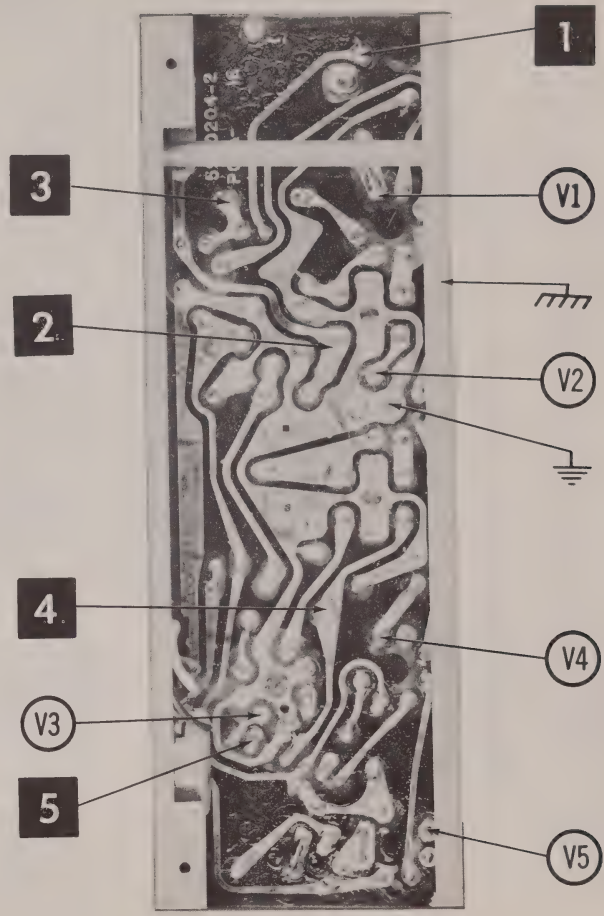
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2200Ω	3-4Ω	RS-2148							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	RB-1057	4A1	

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1 M2	Tuning Cap. Clock Assembly	RS1480	2 Gang (Telechron #C103G99)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

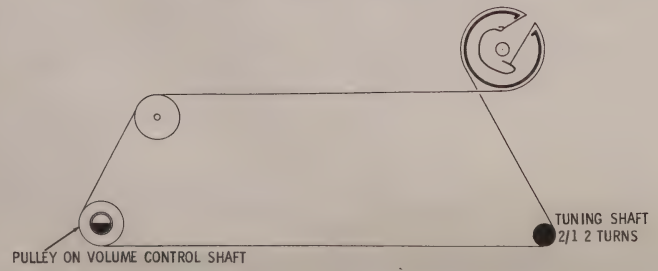
NAME	PART NO.	DESCRIPTION
Knob	RS2040	Tuning, Volume
Knob	RS2200	Clock (Lever Type)
Knob	RS2067	Time Set
Dial Pointer	RS2159	Assembly
Dial Scale & Window	RS2147	
Cabinet Front	RB1115	Model C430A
Cabinet Front	RB1116	Model C431A
Cabinet Back	RB1117	Model C430A
Cabinet Back	RB1118	Model C431A

WIRING DATA

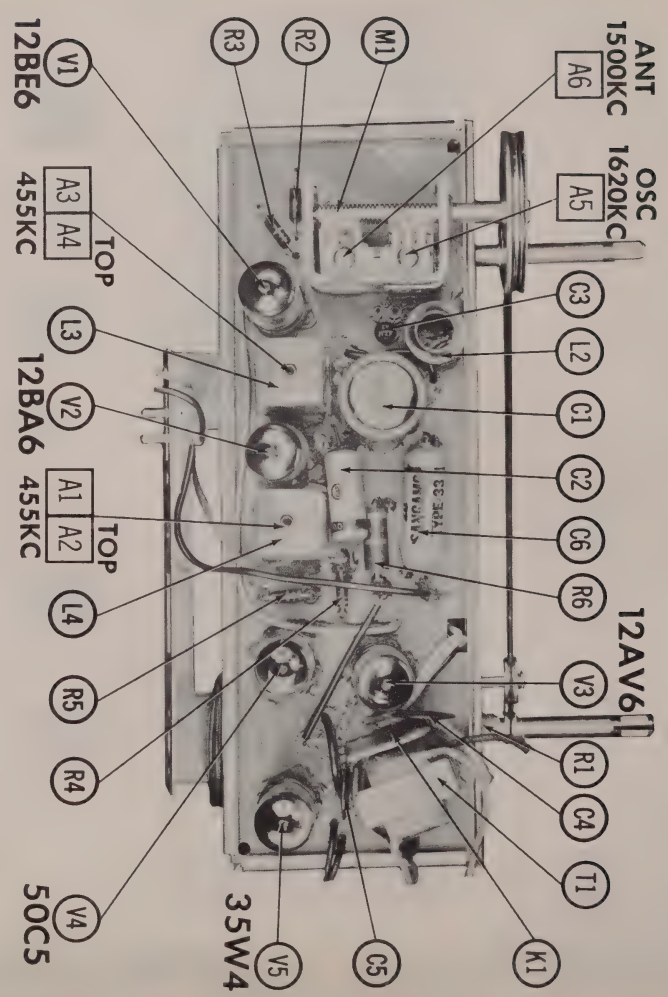
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

DIAL CORD STRINGING



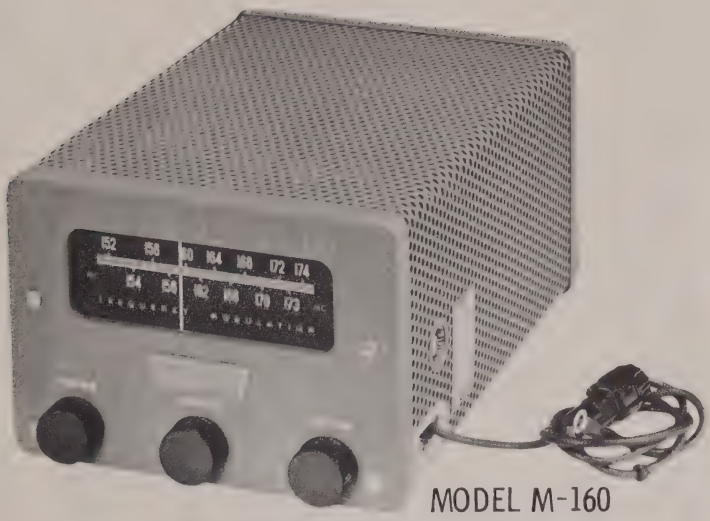
CHASSIS—TOP VIEW



PHOTOFACT® Folder

MONITORADIO
MODELS M-40, M-160

MONITORADIO
MODELS M-40, M-160

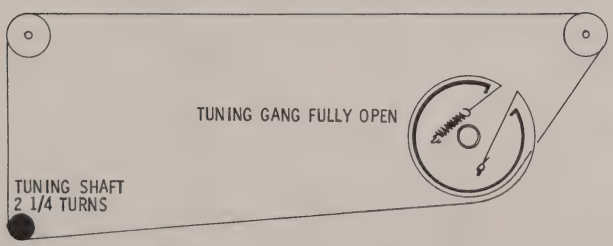


MODEL M-160

MONITORADIO
MODELS M-40, M-160

TRADE NAME	Monitoradio Models M-40, M-160
MANUFACTURER	Monitoradio Div., L D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Indiana
TYPE SET	Battery Operated 10 Tube Mobile FM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 3.5 Amp. @ 12.6 Volts DC
FREQ. RANGE	Model M-40: 30-50MC Model M-160: 152-174MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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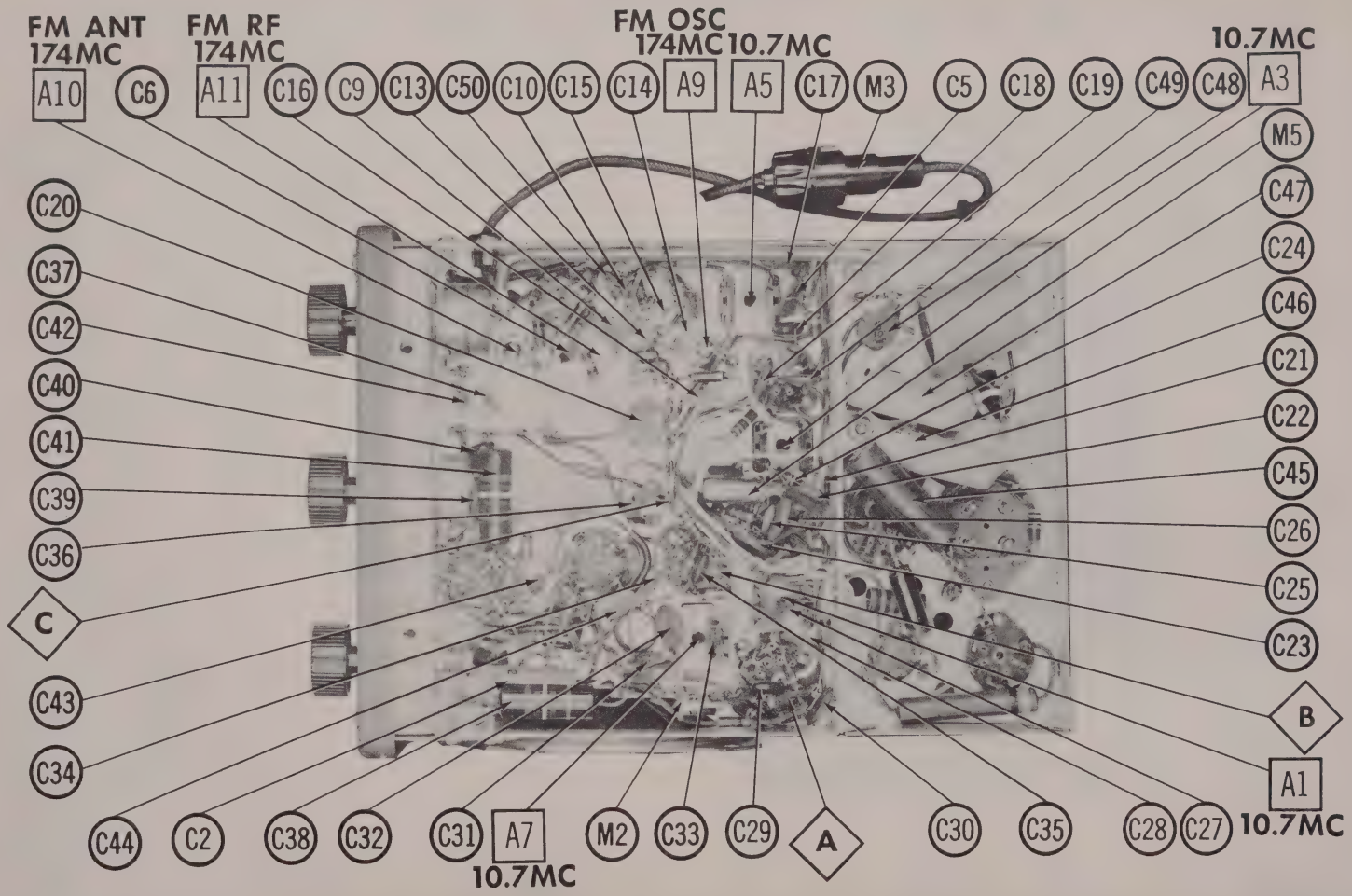
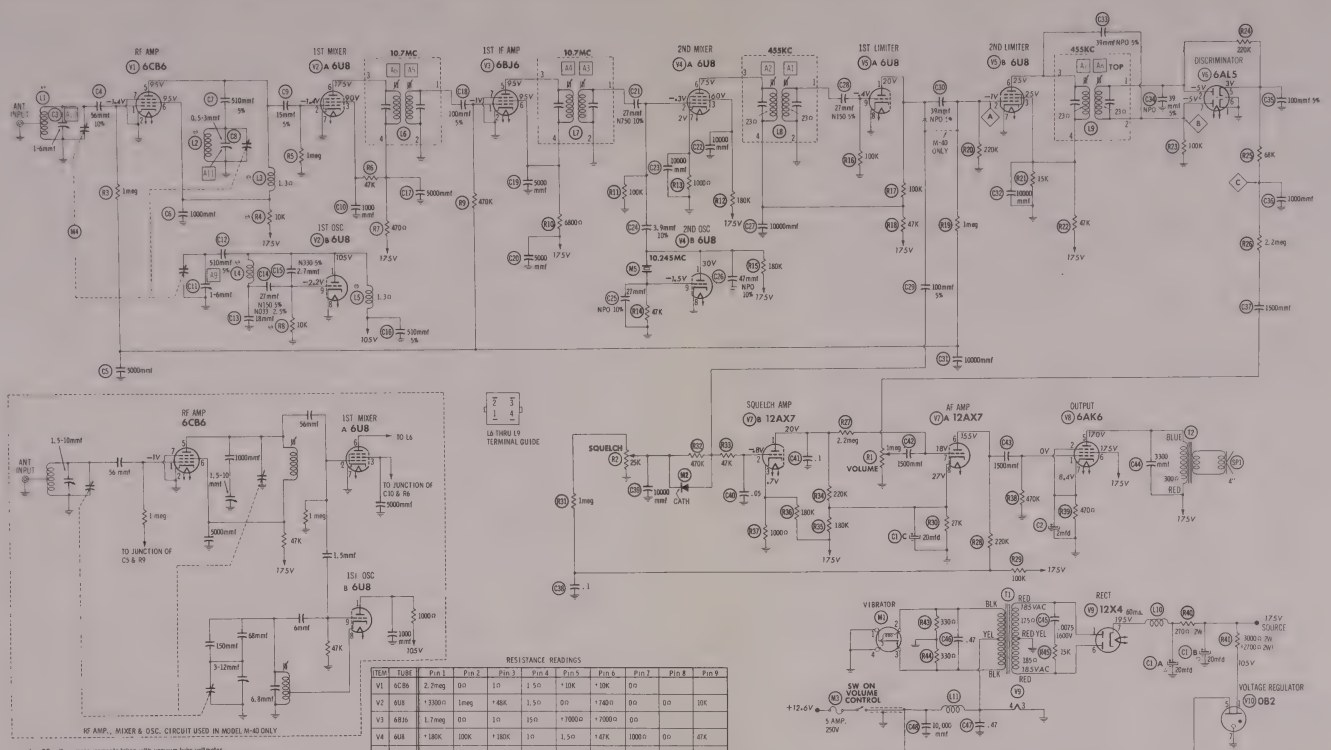
JY523

SET 480 FOLDER 7



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	2.2meg	0Ω	1Ω	1.5Ω	*10K	*10K	0Ω		
V2	6U8	*33000Ω	1meg	*48K	1.5Ω	0Ω	*740Ω	0Ω	0Ω	10K
V3	6BJ6	1.7meg	0Ω	1Ω	15Ω	*70000Ω	*70000Ω	0Ω		
V4	6U8	*180K	100K	*180K	1Ω	1.5Ω	*47K	1000Ω	0Ω	47K
V5	6U8	*150K	220K	*35K	1.5Ω	0Ω	*35K	0Ω	0Ω	100K
V6	6AL5	0Ω	100K	1.5Ω	1Ω	320K	0Ω	100K		
V7	12AX7	*250K	530K	1000Ω	1.5Ω	1.5Ω	*320K	2.5meg	27K	0Ω
V8	6AK6	470K	470Ω	1Ω	5Ω	*.5MΩ	*270Ω	470Ω		
V9	12X4	175Ω	TP	0Ω	1Ω	NC	185Ω	¶		
V10	0B2	*33000Ω	0Ω	INF	0Ω	*33000Ω	INF	0Ω		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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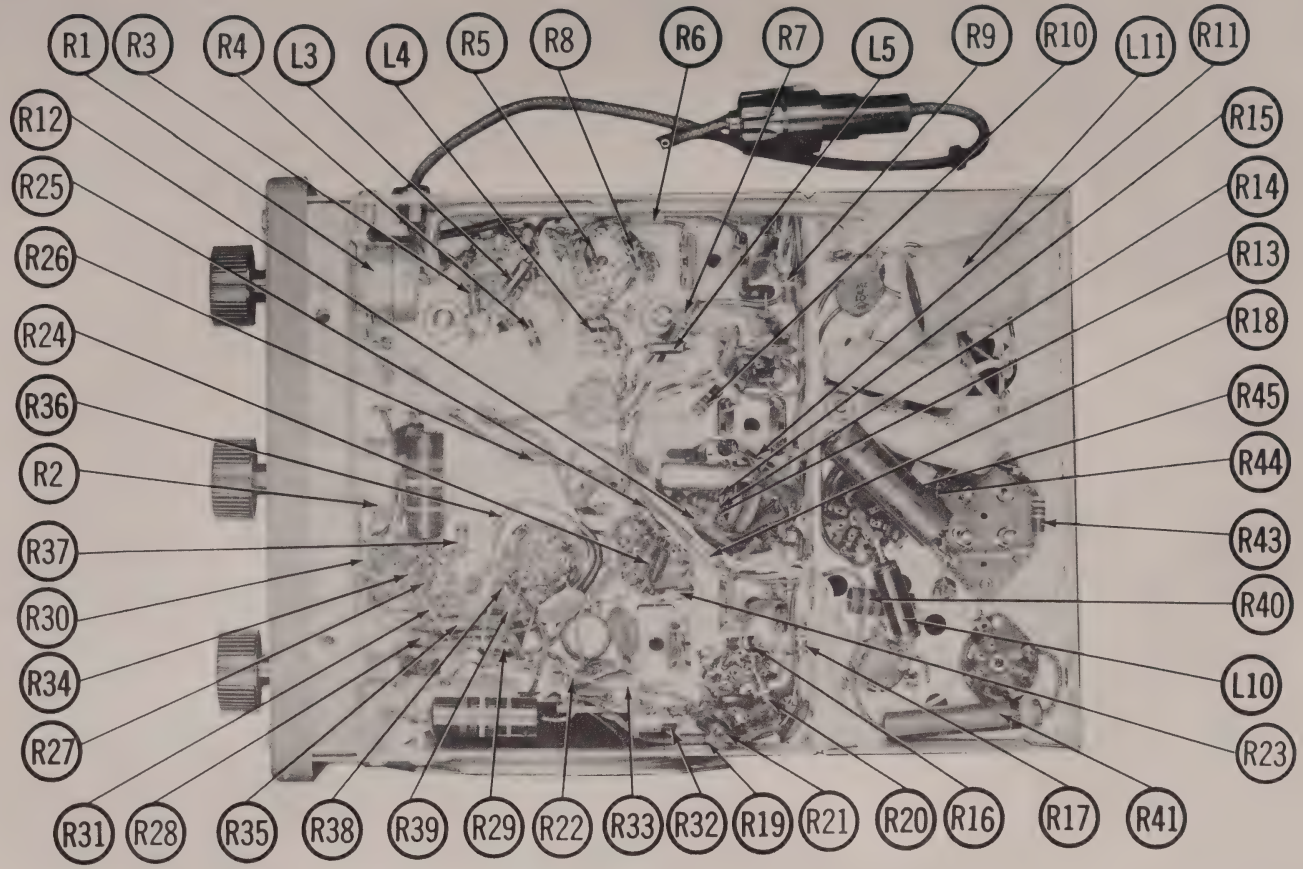
MONITORADIO MODELS M-40, M-160



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

MONITORADIO
MODEL M-40

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Turn Volume and Squelch Controls fully clockwise.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A8	GENERAL CEMENT #8282, 8606, 8606L, 9295
Osc. RF, Ant. Trimmers (Model M-40)	WALSCO #2526, 2543, 2544, 2545
A9, A10, A11 (Model M-160)	GENERAL CEMENT #5004, 5008, 5009
Osc. Coil (Model M-40)	WALSCO #2520

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of 1st Mixer. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	"	"	"	DC probe to point (B). Common to chassis.	A7	"
3.	"	"	"	DC probe to point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of 1st Mixer. Low side to chassis.	10.7MC (200KC Swp.)	Point of non-interference	Vert. Amp. thru 1meg to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	"	"	"	Vert. Amp. thru 1meg to point (B). Low side to chassis.	A7	"
3.	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT FOR M-40

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	REMARKS
4.	Across antenna terminals with 22Ω in high side.	46MC	46MC	DC probe to point (A). Common to chassis.	Adjust oscillator trimmer for maximum deflection.
5.	"	34MC	34MC	"	Adjust oscillator Coil for maximum deflection. Repeat steps 4 and 5 until no further improvement is noted.
6.	"	46MC	46MC	"	Adjust antenna and RF trimmer for maximum deflection.
7.	"	34MC	34MC	"	Adjust antenna and RF coils for maximum deflection. Repeat steps 6 and 7 until no further improvement is noted.

RF ALIGNMENT FOR M-160

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Across antenna terminals with 22Ω in high side.	174MC	174MC	DC probe to point (A). Common to chassis.	A9	Adjust for maximum deflection.
5.	"	152MC	152MC	"	L4	Adjust for maximum deflection. Repeat steps 4 and 5 until no further improvement is noted.
6.		174MC	174MC	"	A10, A11	Adjust for maximum deflection.
7.	"	152MC	152MC	"	L1, L2	Adjust for maximum deflection. Repeat steps 6 and 7 until no further improvement is noted.

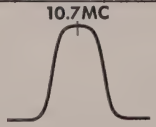


FIG. 1

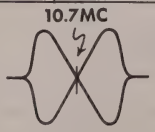


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	6CB6	V6	Discriminator	6AL5
V2	1st Mixer - Osc.	6U8	V7	AF Amp. - Squelch Amp.	12AX7
V3	1st IF Amplifier	6BJ6	V8	Output	6AK6
V4	2nd Mixer - Osc.	6U8	V9	Rectifier	12X4
V5	1st - 2nd Limiter	6U8	V10	Volt Regulator	OB2

ELECTROLYTIC CAPACITORS

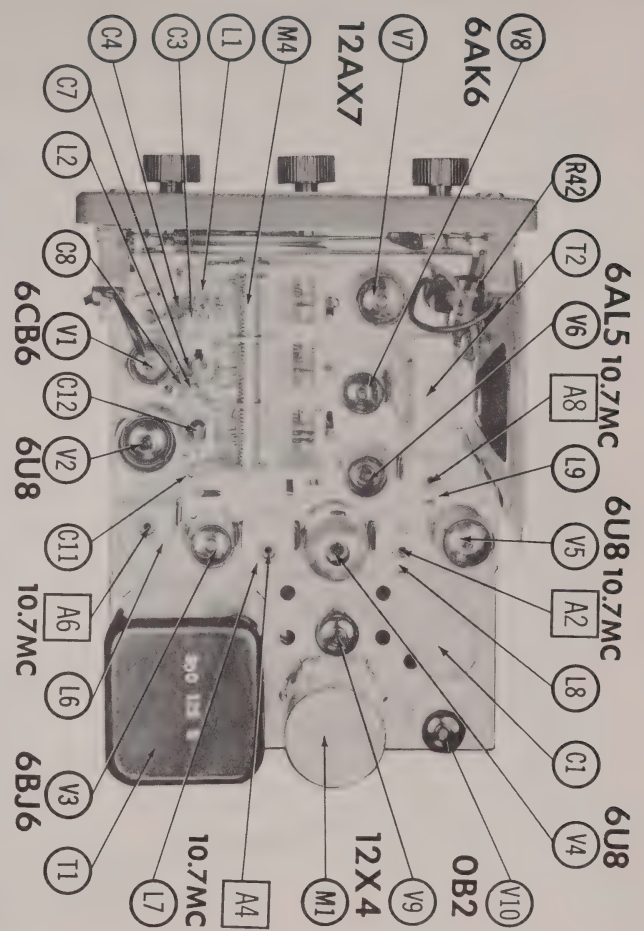
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Monitoradio PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲20	250	300-082-5	AFH3-97	C0710	FP319. 8	TMT-79	TVL-3635	
B	■20	250							
C	20	25							
C2	2	50	300-109-1	PRS1300	BBR2-50	TC302	TD-2-50	TVA-1301	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	1-6			829-6				
C4	56 10%		1469-000056	TCZ-56	22R5Q56	CM-19B-560J	CNO-456	MS-456
C5	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	510 5%		1469-00051		5R5T51	CM-19B-511J		MS-351
C8	.5-3			829-3		CV-1	CT565	
C9	15 5%		1469-000015	TCZ-15	22R5Q15	CM-19B-150J	CNO-415	MS-415
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	1-6			829-6				
C12	510 5%		1469-00051		5R5T51	CM-19B-511J		MS-351
C13	18 N033 2.5%							
C14	27 N150 5%	#100-203-20				*		10TCP-Q27
C15	2.7 N330 5%	#100-203-18				*		
C16	510 5%		1469-00051		5R5T15	CM-19B-511J		MS-351
C17	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C18	100 5%		1469-0001	TCZ-100	22R5T1	CM-19B-101J	MCE235	MS-31
C19	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C20	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C21	27 N750 10%		N750-SI 27	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C24	3.9 10%				C10V4C			10TCC-V39
C25	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C26	47 NPO 10%		NPO-DI 47	TCZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	27 N150 5%	#100-203-20				*		10TCP-Q27
C29	100 5%		1469-0001	TCZ-100	22R5T1	CM-19B-101J	MCE235	MS-31
C30	39 NPO 5%		NPO-DI 39	TCZ-39	C10Q39C	CM-19B-390J	CNO-439	10TCC-Q39
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C33	39 NPO 5%			TCZ-39	C10Q39C	CM-19B-390J	CNO-439	10TCC-Q39
C34	39 NPO 5%			TCZ-39	C10Q39C	CM-19B-390J	CNO-439	10TCC-Q39
C35	100 5%		1469-0001	TCZ-100	22R5T1	CM-19B-101J	MCE235	MS-31
C36	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C37	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C38	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C40	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C41	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C42	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C43	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C44	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C45	.0075 1600V		P1684CM-0075	DD16-752	CUB16D75	16DP-3-752	GEM-16275	MB-D75
C46	.47 100V		P288N-47		CUB2P47	2DP-4-474	GEM-2047	2TM-P47
C47	.47 100V		P288N-47		CUB2P47	2DP-4-474	GEM-2047	2TM-P47

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C48	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C49	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C50	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10

Monitoradio Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

Note 1. Not used in Model M-40.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Monitoradio PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	A-100-093-8	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	25K	½	A-100-093-9	B-27	A47-25K-V		U28	Squelch
B	Shaft			Not Req.	KSS-3		Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	10K	Note 1
R5	1meg	
R6	47K	
R7	470Ω	
R8	10K	Note 1
R9	470K	
R10	6800Ω	
R11	100K	
R12	180K	
R13	1000Ω	
R14	47K	
R15	180K	
R16	100K	
R17	100K	

ITEM No.	RATING	REMARKS
R18	47K	
R19	1meg	
R20	220K	
R21	15K	
R22	47K	
R23	100K	
R24	220K	
R25	68K	
R26	2.2meg	
R27	2.2meg	
R28	220K	
R29	100K	
R30	27K	
R31	1meg	
R32	470K	

ITEM No.	RATING	REMARKS
R33	47K	
R34	220K	
R35	180K	
R36	180K	
R37	1000Ω	
R38	470K	
R39	470Ω	
R40	270Ω 2W	
R41	3000Ω 2W	(2700Ω 2W) *
R42	43Ω 5% 2W	
R43	330Ω	
R44	330Ω	
R45	15K	

Note 1. Model MC-40 uses 47K in this application.

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Monitoradio PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Antenna Coil	300-799 ①						
	Antenna Coil	300-815 ②						
L2	RF Coil	300-800 ①						
	RF Coil	300-803 ②						
L3	RF Choke	300-303-8 ①	19-1004	19-1004	BC-565	4610		6uh
L4	Osc. Coil	300-801 ①						
	Osc. Coil	300-817 ②						
L5	RF Choke	300-303-8 ①	19-1004	19-1004	BC-565	4610		6uh
L6	1st IF Trans.	300-077-2	16-3487	16-3487	FM-254	1463		
L7	2nd IF Trans.	300-077-2	16-3487	16-3487	FM-254	1463		
L8	3rd IF Trans.	300-322-1	16-6758	16-6758	BC-353	12-C2	RF-2	
L9	Discriminator	300-322-1	16-6758	16-6758	BC-353	12-C2	RF-2	
L10	RF Choke	300-303-3	19-1004	19-1004	BC-565	4610		7uh
L11	"A" Lead Choke							13uh

① Model M-160. ② Model M-40.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Monitoradio PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12VCT @ 1.27A	400VCT @ .060A		300-123-5						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Monitoradio PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8600Ω	3-4Ω	500-402 ①	24S52	A-2931	AU-602	A-8114	24S52	S-7X	① Includes SP1

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Monitoradio PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	(Part of T2)	4A1	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				Monitoradio PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1		12	115v		6301	G1601/G859	6301	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Monitoradio PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M2			SD-91	HA504	10H	SR-200	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Monitoradio PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	5A 250V			318005 (3AG 5A 250V)	155020	MTH5	HHJ

MISCELLANEOUS

ITEM No.	PART NAME	Monitoradio PART No.	NOTES
M4	Tuning Cap.	500-150-5	3 Gang, Model M-160
	Tuning Cap.	500-150-6	3 Gang, Model M-40
M5	Crystal	300-304	10.245KC

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	300-754	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

PHOTOFACT® Folder

**OLYMPIC
MODEL 808**

OLYMPIC
MODEL 808

OLYMPIC
MODEL 808

TRADE NAME	Olympic Model 808		
MANUFACTURER	Olympic Radio & TV Inc., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	9 Volts DC	RATING	6MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540—1650KC		14MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3.....	GENERAL CEMENT #5097, 8727 WALSCO #2515
A4, A6.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A5.....	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1650KC	"	"	A4	"
3.	"	540KC	Tuning gang fully closed.	"	A5	"
4.	"	1400KC	Tune to 1400KC signal.	"	A6	"
5.	"	600KC	Tune to 600KC signal.	"		Retouch A5 for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF534

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SET 480 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N486	Converter		2N412	2N486	2N409	PNP
X2	2N483	1st IF Amplifier		2N406	2N483	2N139	PNP
X3	CK879	Overload - AGC		2N406			PNP
X4	2N482	2nd IF Amplifier		2N410			PNP
X5	CK879	Detector		2N410			PNP
X6	2N362	Driver		2N406			PNP
X7	2N632	Output		2N408			PNP
X8	2N632	Output		2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	100	10	150-150	BCD10X8080	EC100-10	TT15X100	ML100-15	TE-1119, 3	
B	100	10			EC100-10	TT15X100	ML100-15	TE-1119, 3	
C2	10	10	①	XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C3	10	10	①	XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C4	50	10	150-130	XPP-10050	NLW50-10	TT10X50	ML50-15	TE-1119	

① Some versions may use 12mfd in this application (Part #150-132).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10		SI 10	D6-100	L10Q10	CCD-100	GP410	10TS-Q10	
C6	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C7	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C8	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C9	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C10	7.5 NPO 5%	#158-118			C10V8C				
C11	50000	Note 1	BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C12	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C13	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50	
C14	5, 24 NPO	#158-117	NPO-DI 5		C10V5C	CCTO-050		10TCC-V5	
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10	
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50	
C17	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50	

Olympic Part Number.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	10K	1/2	120-161	B-15	A47-10K-Z	Q13-116	U18	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-4	SWE-13	76-1	US-26	Power Off-On

RESISTORS

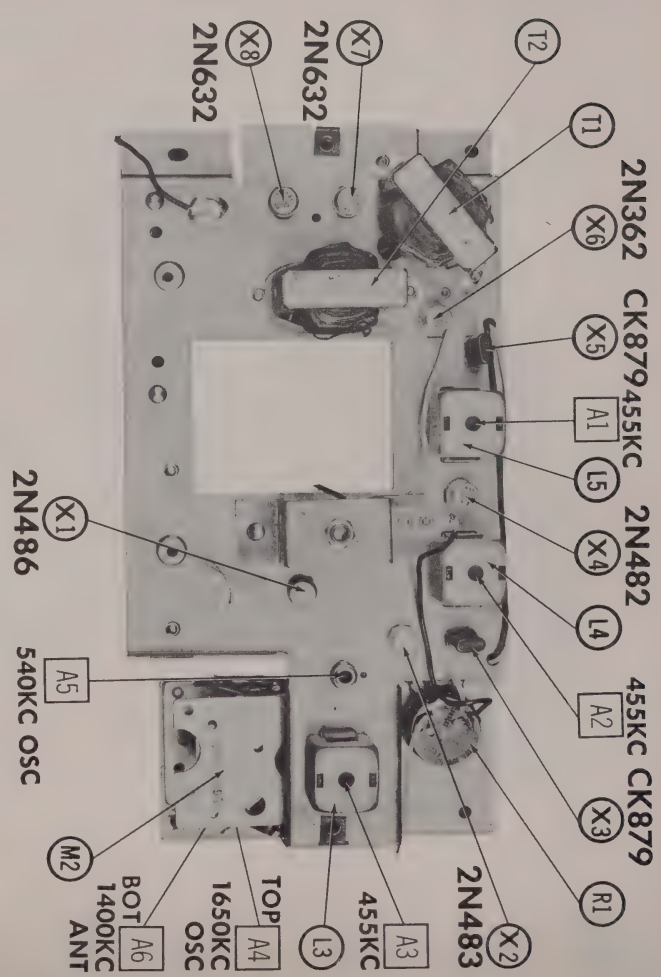
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	6800Ω	
R3	18K	
R4	3900Ω	
R5	680Ω 5%	
R6	560Ω 5%	
R7	2200Ω 5%	

ITEM No.	RATING	REMARKS
R8	330Ω 5%	
R9	15K	
R10	220K 5%	
R11	68K 5%	
R12	10K	
R13	1000Ω	

ITEM No.	RATING	REMARKS
R14	220K 5%	
R15	150Ω 5%	
R16	10Ω	
R17	10Ω	
R18	8200Ω 5%	
R19	560Ω 5%	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	132-145A						
L2	Osc. Coil	136-144						
L3	1st IF Trans.	130-136						
L4	2nd IF Trans.	130-137						
L5	3rd IF Trans.	130-138						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	138-142						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	320Ω CT	3-4Ω	138-143							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	4" x6"	PM	3-4Ω	152-524	46A1	

BATTERIES

ITEM No.	VOLTAGE	OLYMPIC PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			1		635		M14R	6 Required

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M2	Tuning Cap.	160-135B	2 Gang (Ant. 17—263mmf, Osc. 25—128mmf)

CABINETS & CABINET PARTS

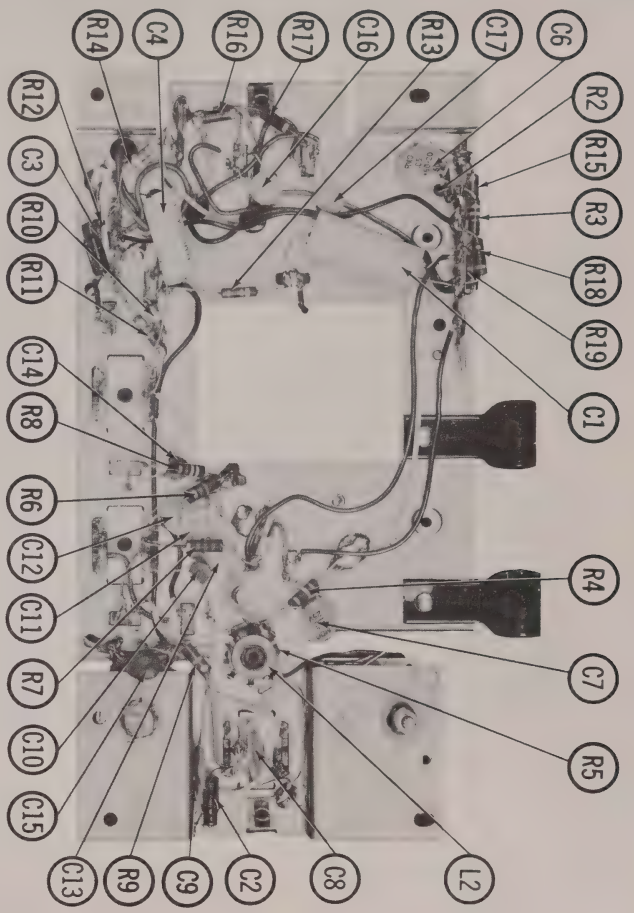
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

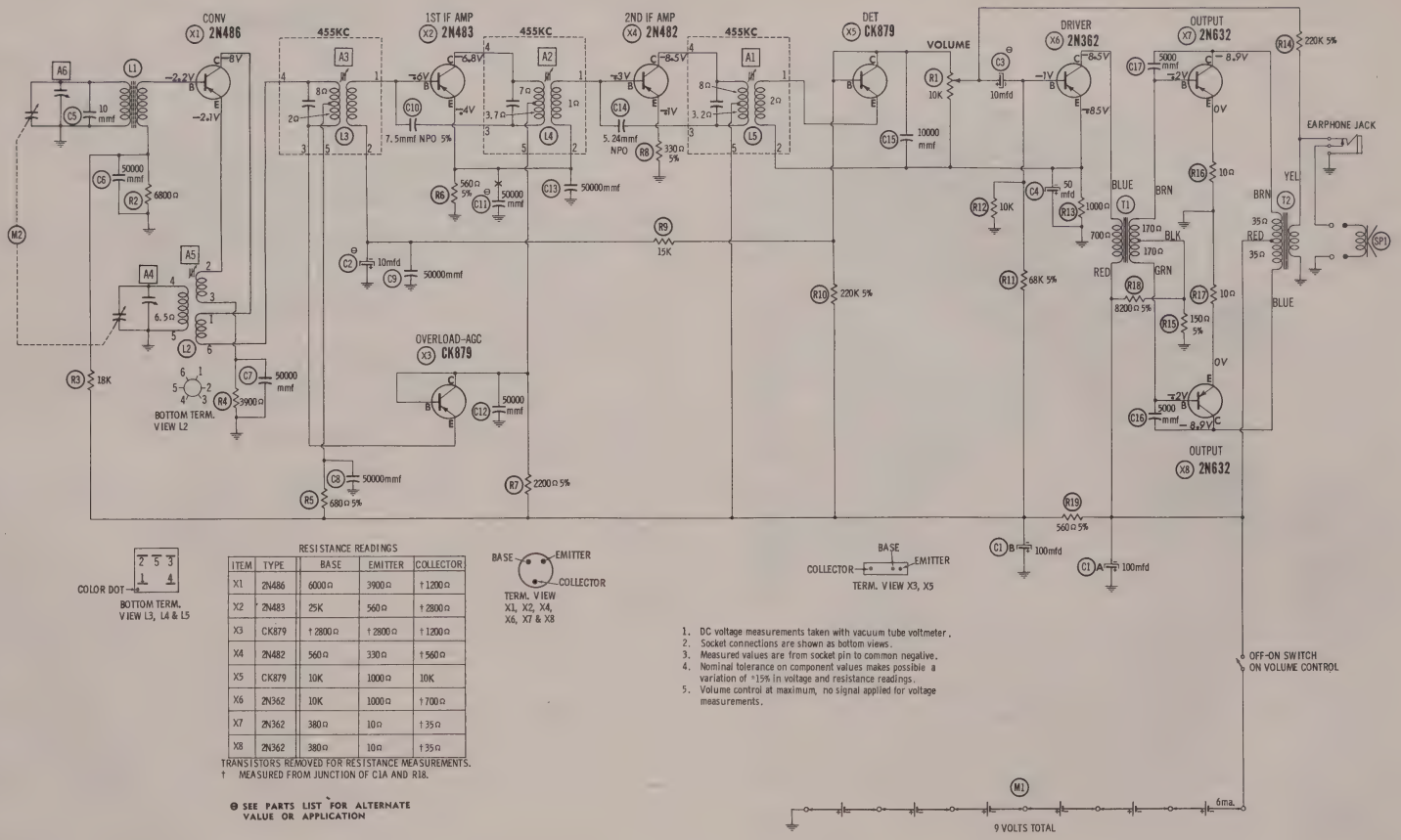
NAME	PART NO.	DESCRIPTION
Knob	220-181	Tuning
Knob	220-179	Volume
Knob	240-134	Handle
Cabinet Shell	210-167	
Front Grille	205-147D	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N486	6000Ω	3900Ω	†1200Ω
X2	2N483	25K	560Ω	†2800Ω
X3	CK879	†2800Ω	†2800Ω	†1200Ω
X4	2N482	560Ω	330Ω	†560Ω
X5	CK879	10K	1000Ω	10K
X6	2N362	10K	1000Ω	†700Ω
X7	2N362	380Ω	10Ω	†35Ω
X8	2N362	380Ω	10Ω	†35Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF C1A AND R18.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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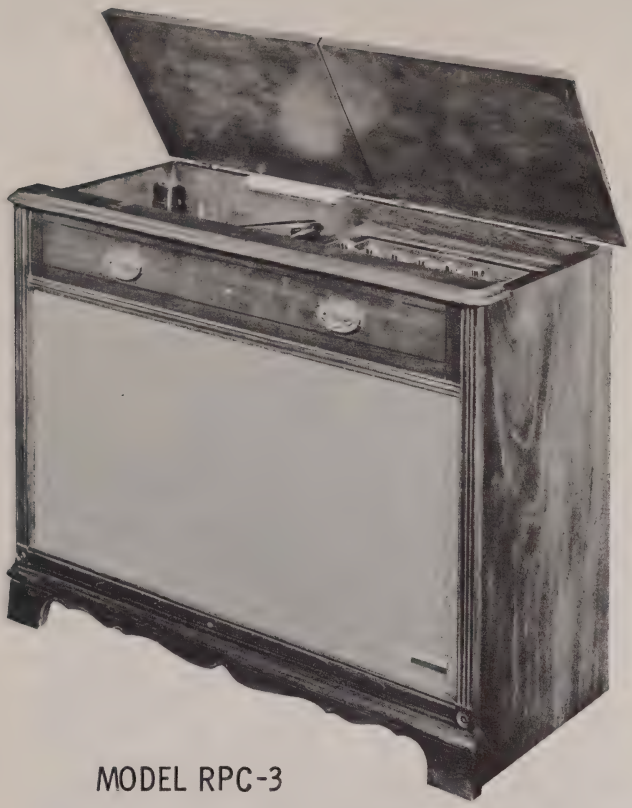
OLYMPIC MODEL 808

PHOTOFACT® Folder

PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)

PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)



MODEL RPC-3

PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)

TRADE NAME	Packard-Bell					
		Chassis				
	Model	Tuner 8TU-1	Tuner 9TU-1	Preamp. PR-2	Amp. DPA-5	Amp. DPA-20
	PT-1			X	X	
	RPC-2				X	X
	RPC-3		X		X	X
	RPT-1	X		X		X
	SAC-3				X	
	Model RMS-1 is an optional Balance and Level Control Unit used with Models RPC-2, RPC-3, RPT-1					
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 S. Figuero St., Los Angeles, Calif.					
TYPE SET	AC Operated FM-AM Tuner, Stereo Amplifier and 4 Speed Automatic Record Changer					
TUBES	Chassis 8TU-1: 8 Chassis 9TU-1: 9 Chassis PR-2: 1 Chassis DPA-5: 4 Chassis DPA-20: 7					
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	160 Watts, 1.5 Amp. @ 117 Volts, AC (Ch. 9TU-1 & DPA-20)			
TUNING RANGE	BROADCAST 530-1620KC FREQ. MOD. 88-108MC		48 Watts, .52 Amp. @ 117 Volts, AC (Ch. PR-2 & DPA-5)			

MODELS PT-1 AND RPT-1 USE RECORD CHANGER PART #58076. FOR SERVICE INFORMATION SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18

MODEL RPC-3 USES RECORD CHANGER PART #58080A. FOR SERVICE INFORMATION SEE GLASER-STEERS GS-77 - PHOTOFACT SET 399 FOLDER 7

MODEL RPC-2 USES RECORD CHANGER PART #58074C. FOR SERVICE INFORMATION SEE COLLARO CONQUEST (REVISED) - PHOTOFACT SET 408 FOLDER 6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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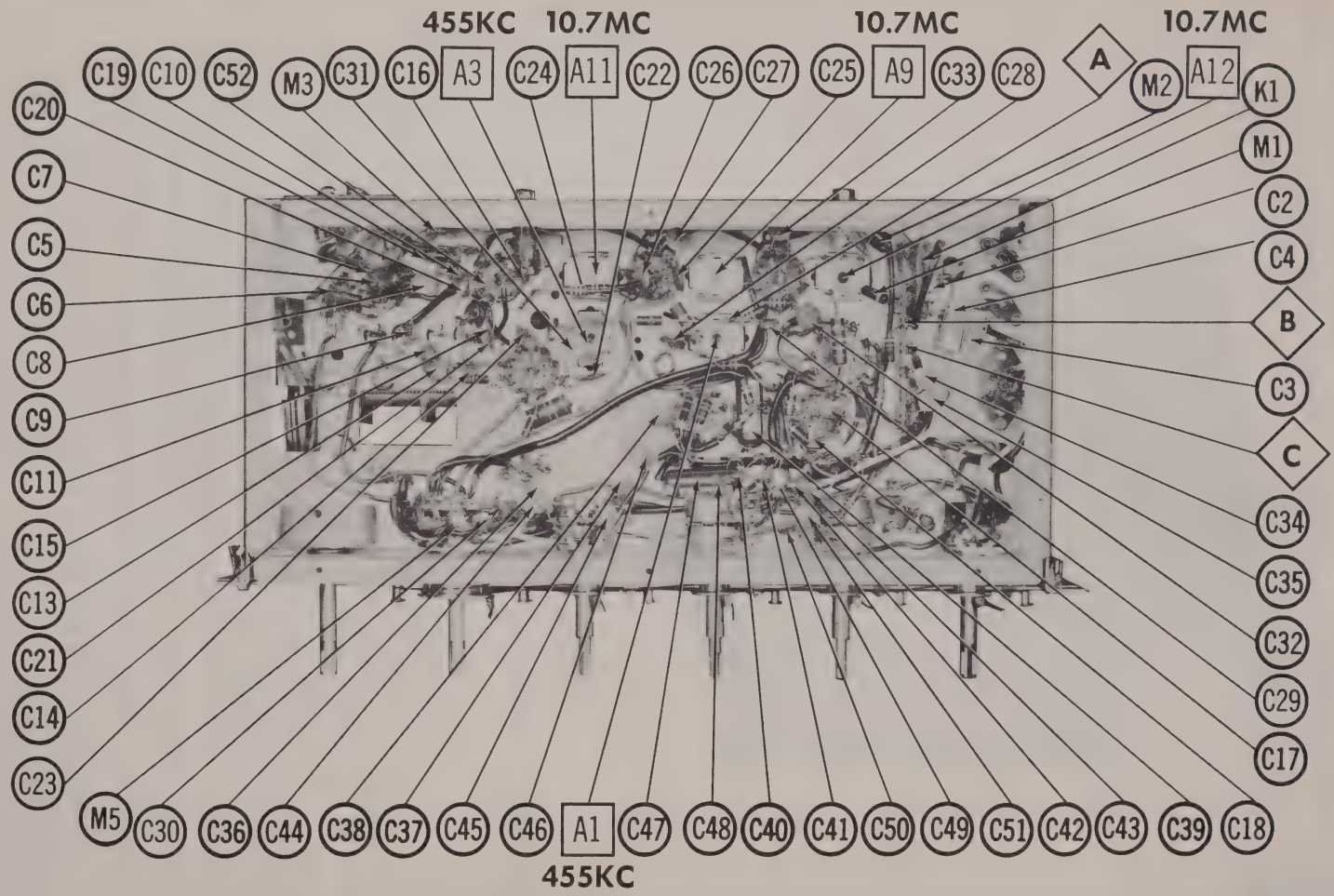
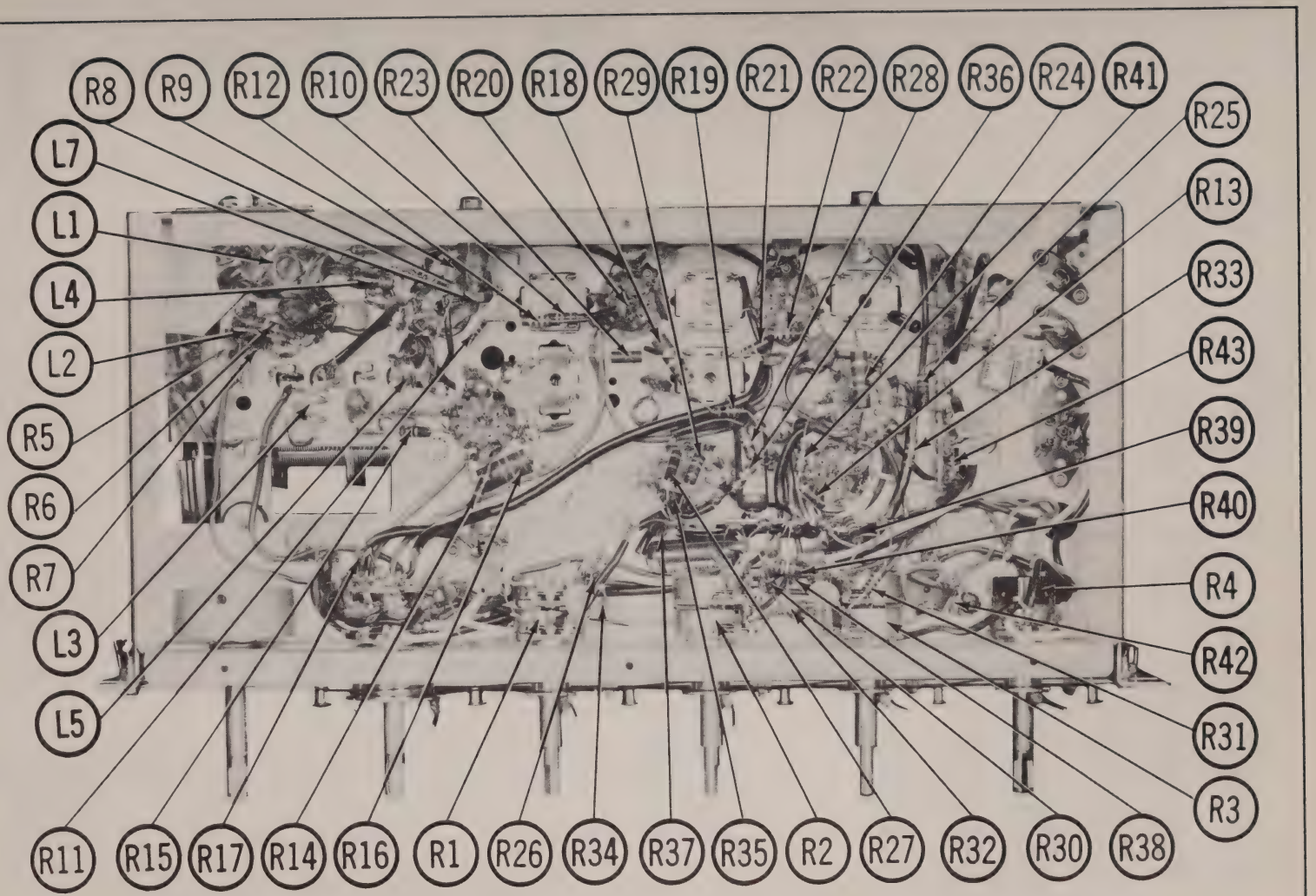


TUNER CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



TUNER CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6BA6
V2	FM Mixer - Osc.	12AT7
V3	FM AFC	6AV6
V4	AM Converter	6BE6
V5	1st FM - AM IF Amp.	6BA6
V6	2nd FM IF Amp. - AM Det. - AVC	6AU6A
V7	Tuning Indicator	6E5 Note 1
V8	Channel 1 AF Amp. - Channel 2 AF Amp.	7025
V9	Channel 1 AF Amp. - Channel 2 AF Amp.	7025

Note 1. Not used in Chassis 8TU-1.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■30	450	24177	AFH2-52	B0410	FP259	TMD-51	TVL-2757	
B	▲10	450							
C2	5	50	24164	PWE50005	EC5-50	TT50X5	ML5-50	TE-1303	
C3	40	10	24151	PWE10040	NLW40-15	TC48	ML40-15	TVA-1413	
C4	40	10	24151	PWE10040	NLW40-15	TC48	ML40-15	TVA-1413	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C10	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	GP110	5HK-D10
C11	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C12	1.5-10	Note 2		829-10				
C13	68 NPO 5%			DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C14	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C15	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C20	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C21	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C24	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C29	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C30	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C31	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C34	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C35	10000	Note 3	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C36	1500 10%	Note 4	DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C40	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C41	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C42	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C44	1500 10%	Note 4	DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C46	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C47	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C48	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C49	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C50	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C51	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

Note 1. Not used in some versions.
Note 2. Included with Tuning Gang (M4).
Note 3. Used in Chassis 9TU1 only.
Note 4. Chassis 8TU1 uses 10000mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg		25079 ①					Loudness, Channel 2
	100K Tap							
B	1meg							Loudness, Channel 1
	100K Tap							
R2A	1meg		25532					Treble, Channel 2
B	1meg							Treble, Channel 1
R3A	1meg		25532					Bass, Channel 2
B	1meg							Bass, Channel 1
R4A	50K		25983					Balance
B	Switch							Push-Pull Off-On

① Some versions may use Part #25068 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	1000Ω	
R6	22K 1W	
R7	68Ω	
R8	3.3meg	
R9	10Ω	
R10	1000Ω	
R11	22K	
R12	27K	
R13	1200Ω	
R14	10Ω	
R15	22K	
R16	15K 2W	
R17	1meg	
R18	22K 1W	

Note 1. Not used in Chassis 8TU-1.

ITEM No.	RATING	REMARKS
R19	1000Ω	
R20	68Ω	
R21	220K	
R22	270K	
R23	2.2meg	
R24	18K 1W	
R25	4.7meg	Note 2
R26	33K	
R27	1meg	
R28	100K	
R29	1800Ω	
R30	220K	
R31	22K	
R32	68K	

Note 2. Not used in some versions.

ITEM No.	RATING	REMARKS
R33	10K	
R34	33K	
R35	1meg	
R36	100K	
R37	180K	
R38	220K	
R39	22K	
R40	68K	
R41	10K	
R42	100K	
R43	4.7meg	Note 1
R44	1meg	Note 1

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell PART No.	REPLACEMENT DATA
K1	Ratio Detector Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	23627A	Aerovox PA-694 Centralab PC-342

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Packard-Bell PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Antenna Coil	29426						
L2	RF Choke	29124	19-1000	19-1000	BC-561	4602		luh
L3	FM RF Coil	29165						
L4	RF Choke	29124	19-1000	19-1000	BC-561	4602		luh
L5	FM Osc. Coil	29243A						
L6	Loopstick	29364 †			BC-419			
L7	AM Osc. Coil	29247A *	14-1074 ①	14-1074 ①	BC-393			
L8	1st FM IF Trans.	29148 *	16-3487	16-3487	FM-254	1463		
L9	1st AM IF Trans.	29077	16-6758	16-6758	BC-352	12-C1	RF-1	
L10	2nd FM IF Trans.	29152 ♦	16-3487	16-3487	FM-254	1463		
L11	2nd AM IF Trans.	29078	16-6758	16-6758	BC-353	12-C2	RF-2	
L12	Ratio Det.	29084	17-3498	17-3498	FM-255	1465		

† Alternate Part #29360.
* Alternate Part #29164.

① Mount with leads.
♦ Alternate Part #29167.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Packard-Bell PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M1	1N541	72027	1N60	1N295	1N295	Ratio Det. (Pigtail)) Matched
M2	1N541	72027	1N60	1N295	1N295	Ratio Det. (Pigtail)) Pair
M3	1N295	72028	1N60	1N295	1N295	AFC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M4	Tuning Cap.	23561	4 Gang (Ant. 24-324mmf, Osc. 14-120mmf) - Includes C12
M5	Switch	86073	Selector (Rotary Type)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PRE AMP PARTS LIST AND DESCRIPTIONS

TUBES

♦ CBS ♦ GENERAL ELECTRIC ♦ RAYTHEON ♦ SYLVANIA ♦					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V10	Channel 1 Preamp. - Channel 2 Preamp.	7025			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C53	40	350	24063	PRS1670	BR4035	TC78	TD-40-350	TVA-1611	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C54	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C55	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C56	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C57	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C58	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C59	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C60	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C61	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R45A	1meg	Linear Taper	25077					Balance, Channel 2
B	1meg							Volume, Channel 1
R46A	1meg		25532					Bass, Channel 2
B	1meg							Bass, Channel 1
R47A	1meg		25532					Treble, Channel 2
B	1meg							Treble, Channel 1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R48	1meg	
R49	100K	
R50	1800Ω	
R51	220K	
R52	68K	

ITEM No.	RATING	REMARKS
R53	22K	
R54	1meg	
R55	100K	
R56	1800Ω	
R57	220K	

ITEM No.	RATING	REMARKS
R58	68K	
R59	22K	
R60	220K	

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M6	Switch	86309	Off-On

FOLDER 9
PACKARD-BELL MODELS PT-1, KMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-2O, PR-2, 8TU-1, 9TU-1)

AM ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

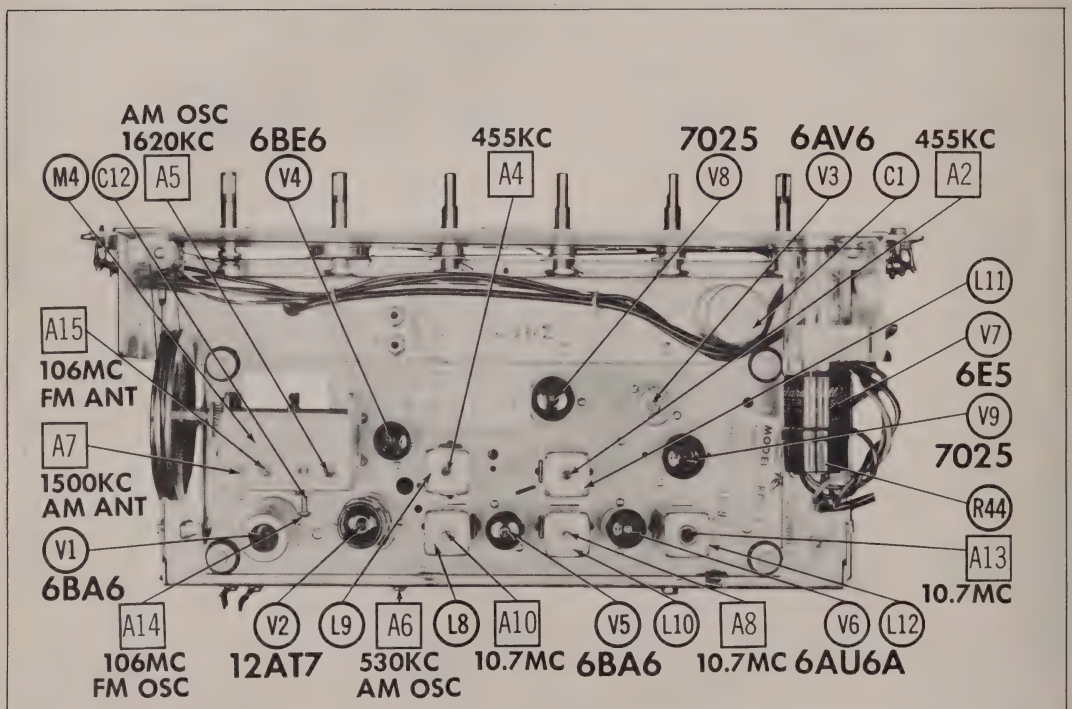
A5, A7, A14, A15... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A6, A12, A13 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

A8 thru A11 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter Low side to chassis.	455KC (400~ Mod.)	AM Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1620KC	"	"	A5	"
3.	"	530KC	"	"	A6	"
4.	"	1500KC	Tune to 1500KC signal	"	A7	Adjust for maximum deflection while rocking tuning gang.



TUNER CHASSIS—TOP VIEW

FM ALIGNMENT INSTRUCTIONS

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A12	"
7.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11	Adjust for maximum gain and symmetry of response similar to Fig. 1.
6.	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A12	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1.
7.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 150Ω in each lead.	106MC (Unmod.)	FM 106MC	DC probe to point Ⓑ. Common to chassis.	A14, A15	Adjust for maximum deflection.
9.	"	92MC	92MC	"	L3, L5	Adjust for maximum deflection. Repeat steps 8 and 9 until no further improvement is noted.

FIG. 1

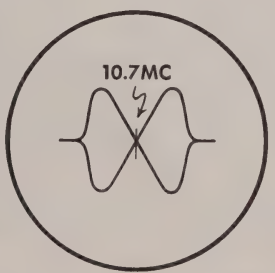
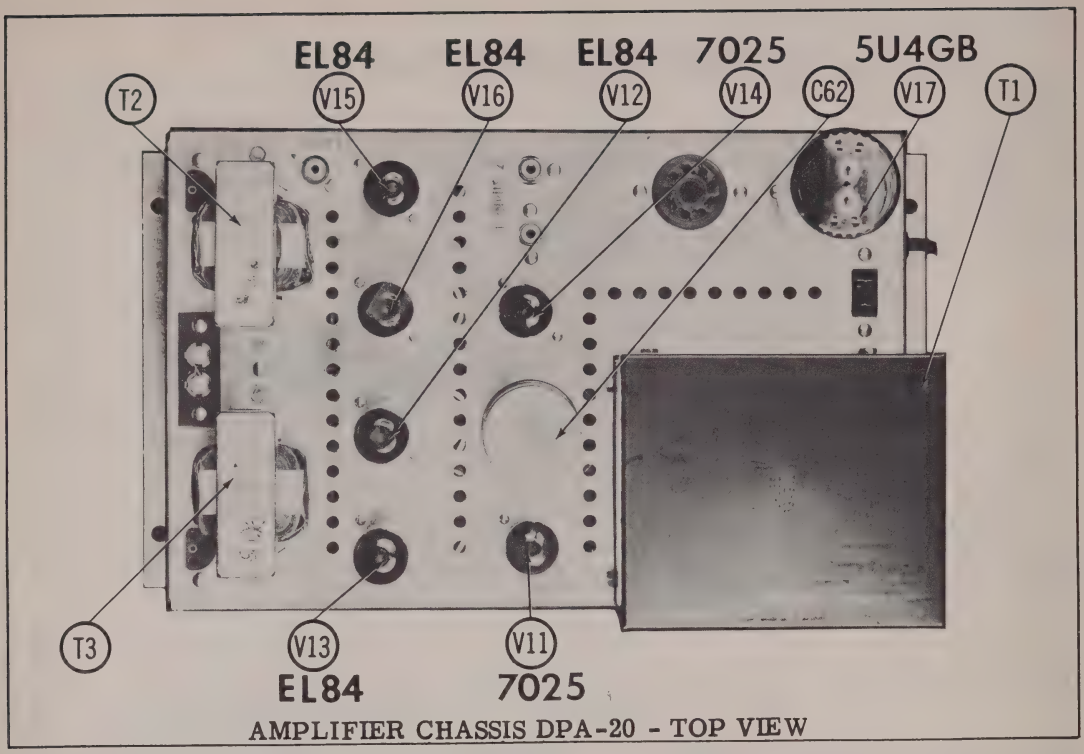
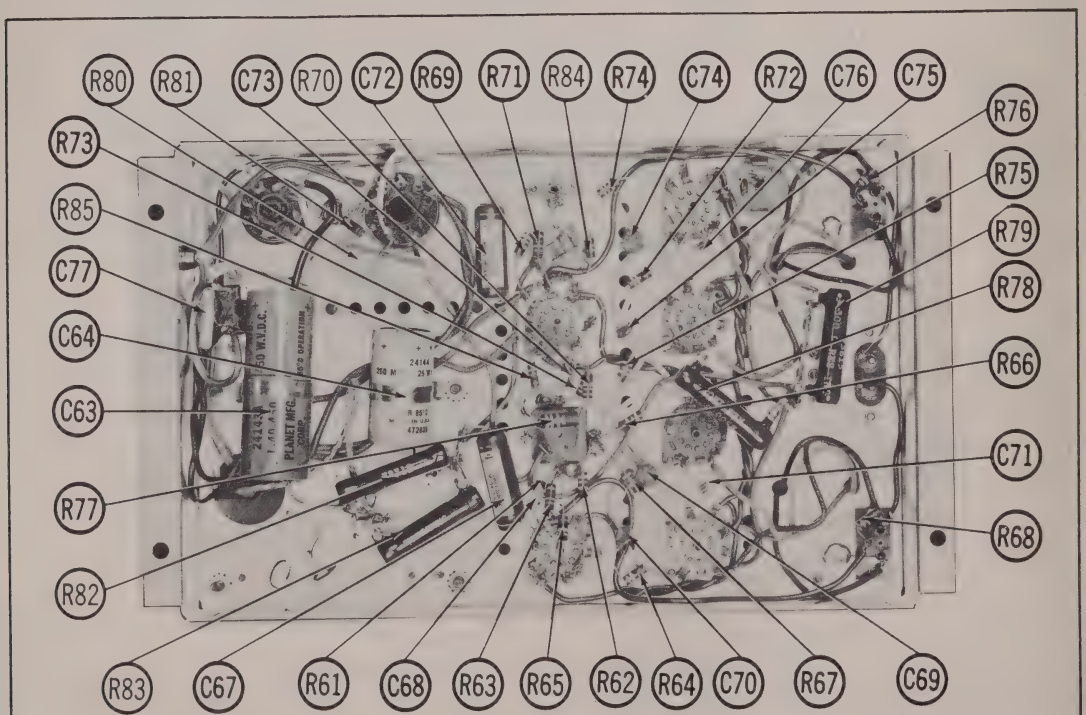


FIG. 2



AMPLIFIER CHASSIS DPA-20 - TOP VIEW



AMPLIFIER CHASSIS DPA-20 - BOTTOM VIEW

AMP DPA-20 PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆		
ITEM No.	USE	TYPE
V11	Channel 1 AF Amp. - Phase Inverter	7025
V12	Channel 1 Output	EL84/6BQ5
V13	Channel 1 Output	EL84/6BQ5
V14	Channel 2 AF Amp. - Phase Inverter	7025
V15	Channel 2 Output	EL84/6BQ5
V16	Channel 2 Output	EL84/6BQ5
V17	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C62A	▲40	450	24147	AFH3-43-50	C0344	FP376.9	TMT-39	TVL-3786	
B	■40	450							
C	▲20	450							
C63	40	450	24143	PRS1750	BR4045	TC78	TD-40-450	TVA-1712	
C64	250	25	24144	PRS1280	BR2502	TC50025	TD-250-25	TVA-1208	
C65	5	25NP	24146	NP-PRS7550	BBR10-25 †	TCN504		TVAS-1203.1*	
C66	10	25NP	24179	NP-PRS7315	BBR20-25 †	TCN5010		TVAS-1204.1*	Note 1

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Model RPC-2 uses 5mfd in this application (Part #24146).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C67	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C68	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C69	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C70	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C71	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C72	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C73	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C74	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C75	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C76	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C77A	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
B	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R61	470K	
R62	470K	
R63	1800Ω	
R64	100K	
R65	100K	
R66	470K	
R67	470K	
R68	100K	
R69	470K	

ITEM No.	RATING	REMARKS
R70	470K	
R71	1800Ω	
R72	100K	
R73	100K	
R74	470K	
R75	470K	
R76	100K	
R77	47K 5% 1W	
R78	2500Ω 10W	

ITEM No.	RATING	REMARKS
R79	300Ω 5% 10W	
R80	2700Ω 7W	
R81	10Ω	
R82	130Ω 10W	Note 1
R83	130Ω 10W	Note 1
R84	100Ω	
R85	100Ω	

Note 1. In Model SAC-3, R82 and R83 may be a single 300Ω 10W.
In Models RPC-2, RPC-3, R82 and R83 may be a single 82Ω 3W.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .52A	710VCT @ .190A	5V @ 3A	89083						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 3.7A	6.3V @ 2.4A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5500Ω CT	3-4Ω	89460A			AU-609				
T3	5500Ω CT	3-4Ω	89460A			AU-609				

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	83110 *	4A0TZ8	* Used in Model RPC-2.
	15"	PM	3-4Ω	83129 ♦	15A10LZ3.2	♦ Used in Models RPC-3 and SAC-3.
SP2	4"	PM	6-8Ω	83110 *	4A0TZ8	
	6" x 9"	PM	3-4Ω	83112 ♦	69A2	
SP3	10"	PM	6-8Ω	83711A *	10A3IZ8	
	Tweeter Horn		3.2Ω	83128 ♦		
SP4	10"	PM	6-8Ω	83711A *	10A3IZ8	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Packard-Bell PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M7	63046 (Model RPC-2)	13TB *		26S *	S1-1 † S3-1 †			8TA4-S *	N-8TA-S *
	63042 (Model RPC-3)	13TB *		66 * ‡				8TA4-S *	N-8TA-S *

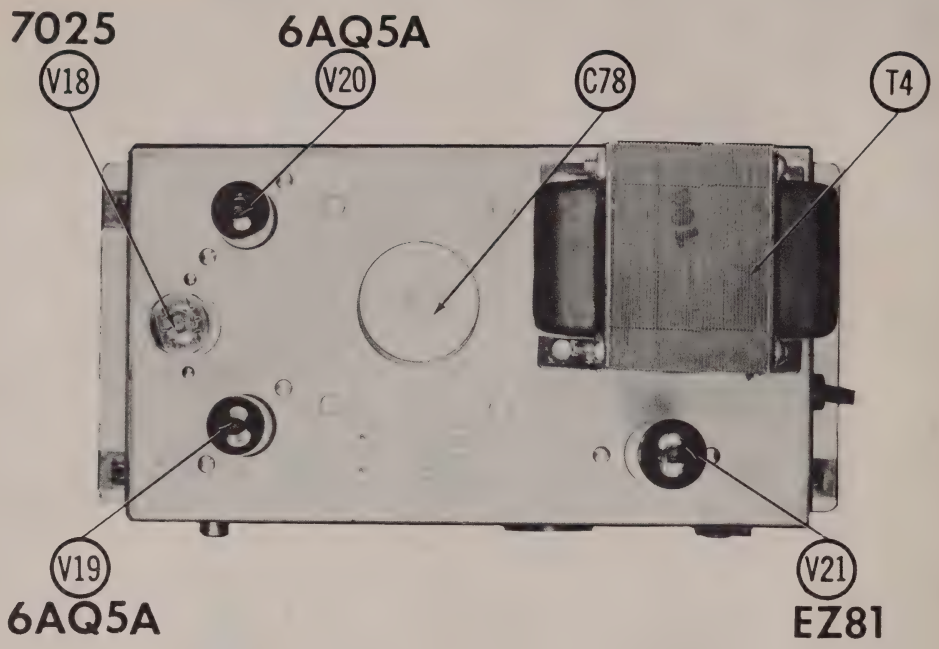
* Dual sapphire needles. † Saphire needle. ‡ Use Mount PT-3.

PHONO NEEDLE

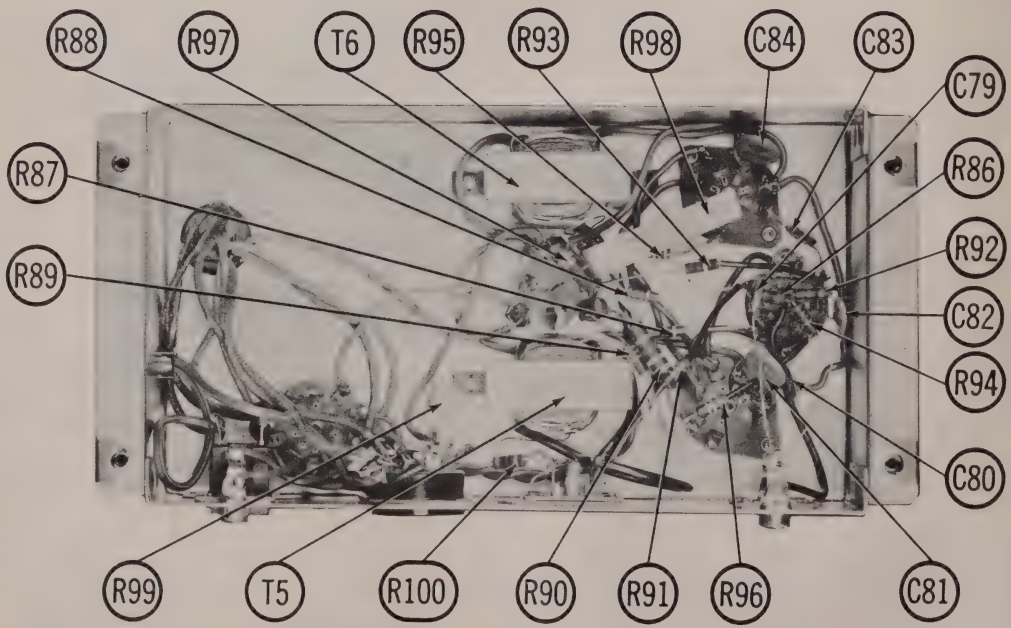
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Packard-Bell PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M8	(Model RPC-2)	W-101STS † or W-102S † or W-101STD † ♦ and W-102MGS † or W-102MGD ♦	E-98 † or E-98D ♦ and E-98X † or E-98XD ♦	† Jewel ♦ Diamond
	(Model RPC-3)	W-110STS † † or W-110STD † ♦	SC-1X	

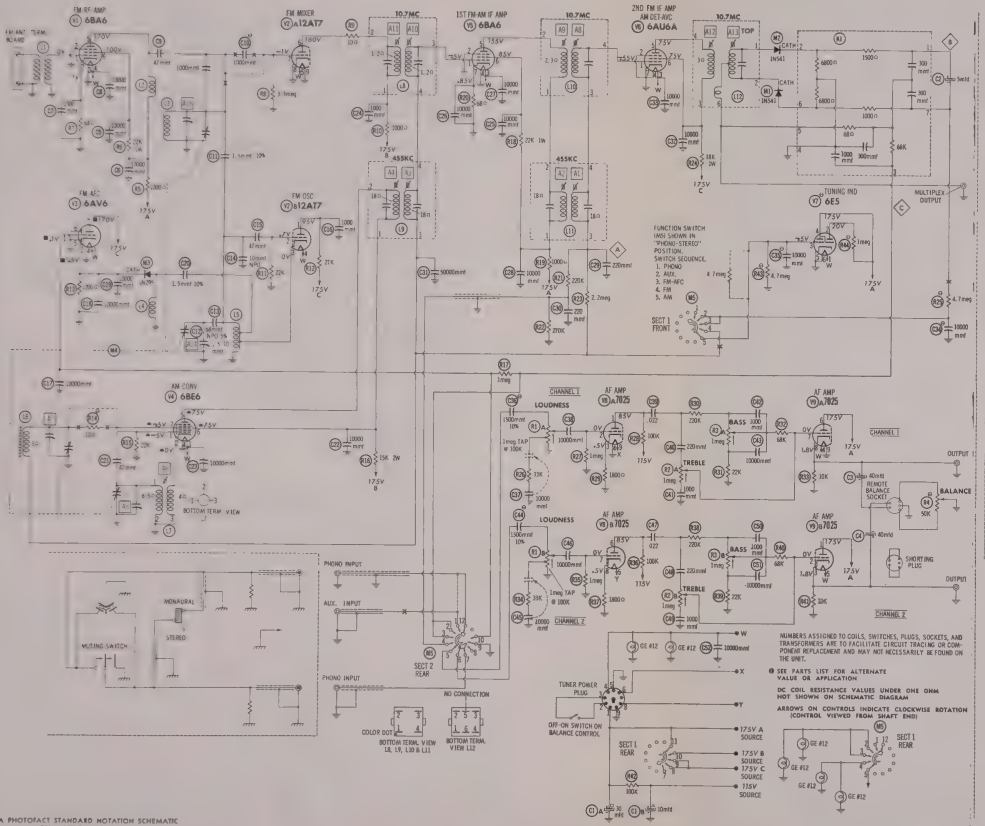
PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)



AMPLIFIER CHASSIS DPA-5 - TOP VIEW



AMPLIFIER CHASSIS DPA-5 - BOTTOM VIEW


FM RF AMP V1 6BA6
FM MIXER V2 12AT7
10.7MC
1ST FM-AM IF AMP V5 6BA6
2ND FM IF AMP AM DET-AVC V6 6AU6A
FM AFC V3 6AV6
FM OSC V4 12AT7
455KC
TUNING IND V7 6E5
MULTIPLEX OUTPUT
FUNCTION SWITCH (AS SHOWN IN "PHONO-STEREO" POSITION. SWITCH SEQUENCE. 1. PHONO 2. AUX. 3. FM-AFC 4. FM 5. AM)
SECT 1 FRONT
AM CONV V8 6B6
BOTTOM TERM. VIEW
CHANNEL 1
LOUDNESS
AF AMP V9 7025
BASS
TREBLE
OUTPUT
BALANCE
REMOTE BALANCE SOCKET
CHANNEL 2
SHORTING PLUG
PHONO INPUT
AUX. INPUT
MONAURAL
STEREO
MUTING SWITCH
SECT 2 REAR
NO CONNECTION
COLOR DOT
BOTTOM TERM. VIEW L8, L9, L10 & L11
BOTTOM TERM. VIEW L12
TUNER POWER PLUG
OFF-ON SWITCH ON BALANCE CONTROL
SECT 1 REAR
175V A SOURCE
175V B SOURCE
175V C SOURCE
115V SOURCE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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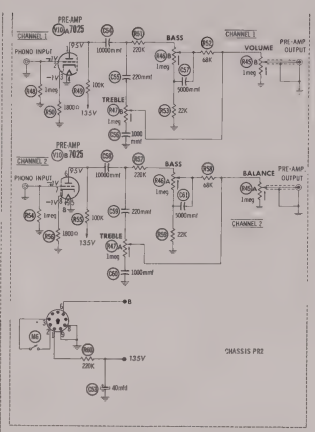
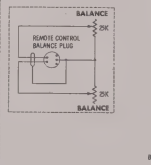
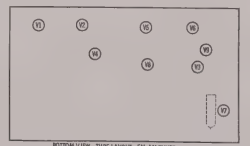
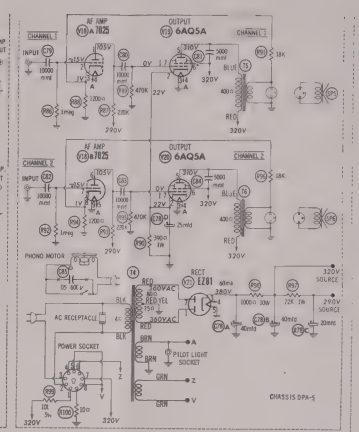
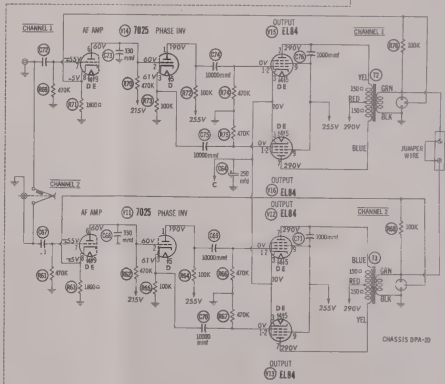
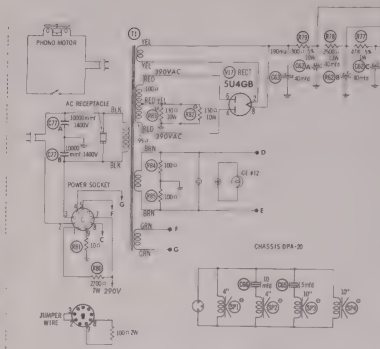












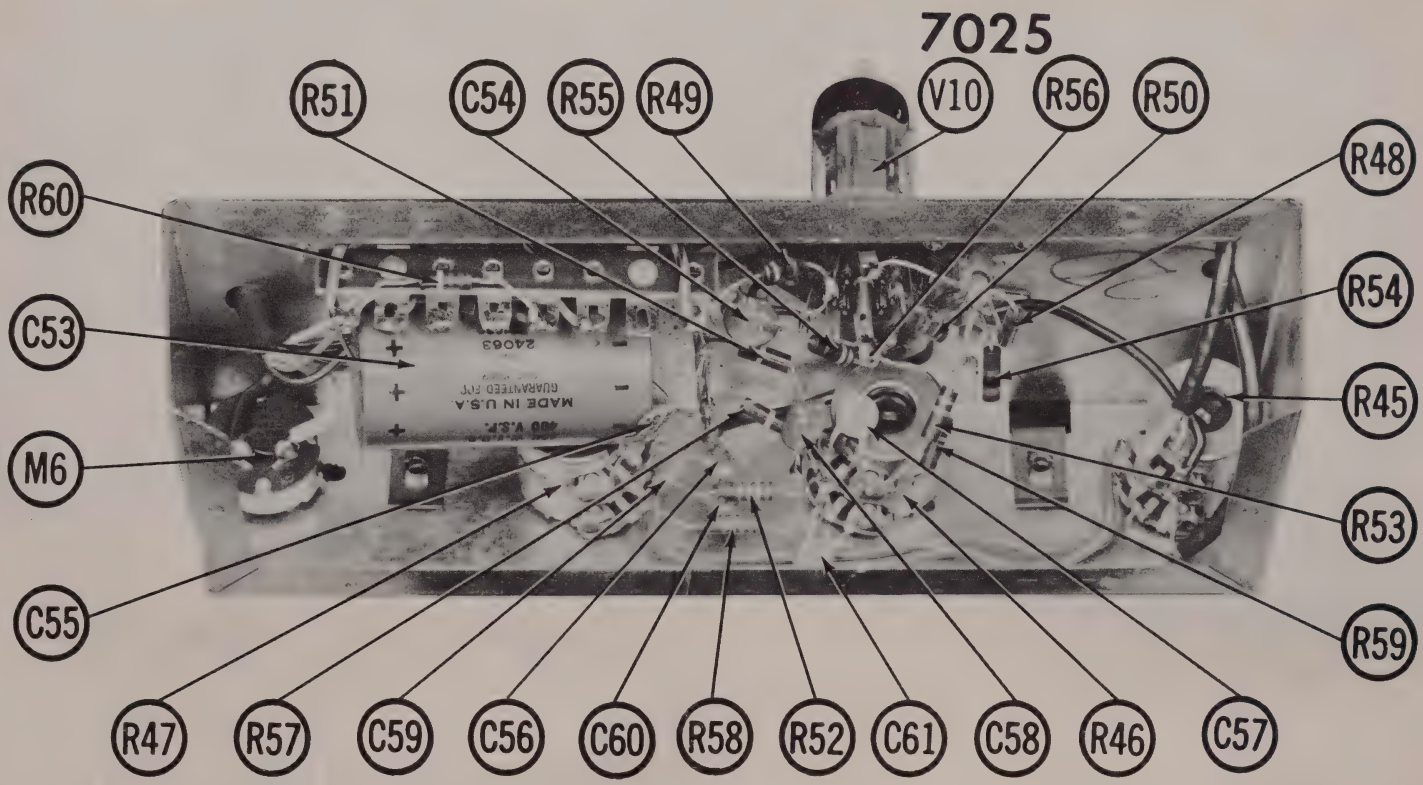
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	.10	0Ω	0Ω	.10	↑4000Ω	↑28K	68Ω		
V2	12AT7	↑10K	22K	0Ω	.10	.10	↑4000Ω	3.7meg	0Ω	0Ω
V3	6AV6	0Ω ▲1meg	1000Ω	.10	0Ω	0Ω	0Ω	↑3000Ω		
V4	6BE6	▲22K	▲.50	.10	0Ω	↑▲18K	↑▲18K	2.7meg		
V5	6BA6	2.7meg	0Ω	.10	0Ω	↑4000Ω	↑28K	68Ω		
V6	6AU6A	490K	0Ω	.10	0Ω	↑22K	↑22K	0Ω		
V7	6E5	.10	↑1meg	2.7meg	↑3000Ω	0Ω	0Ω			
V8	7025	↑200K	1meg	1800Ω	0Ω	120	↑250K	1meg	1800Ω	60Ω
V9	7025	↑3000Ω	90K	10K	.10	.10	↑3000Ω	90K	10K	0Ω
V10	7025	↑↑330K	1meg	1800Ω	0Ω	0Ω	↑↑330K	1meg	1800Ω	120Ω
V11	7025	↑100K	↑520K	100K	50Ω	50Ω	↑320K	470K	1800Ω	50Ω
V12	EL84 6BQ5	470K	470K	10Ω	50Ω	50Ω	NC	↑450Ω	NC	50Ω
V13	EL84 6BQ5	470K	470K	10Ω	50Ω	50Ω	NC	↑450Ω	NC	50Ω
V14	7025	↑100K	↑520K	100K	50Ω	50Ω	↑320K	470K	1800Ω	50Ω
V15	EL84 6BQ5	470K	470K	10Ω	50Ω	50Ω	NC	↑450Ω	NC	50Ω
V16	EL84 6BQ5	470K	470K	10Ω	50Ω	50Ω	NC	↑450Ω	NC	50Ω
V17	5U4GB	NC	1	NC	350Ω	NC	160Ω	NC	1	
V18	7025	↑↑340K	1meg	1200Ω	20Ω	20Ω	↑↑340K	1meg	1200Ω	0Ω
V19	6AU5A	470K	390Ω	0Ω	20Ω	↑1400Ω	↑1000Ω	470K		
V20	6AU5A	470K	390Ω	0Ω	20Ω	↑1400Ω	↑1000Ω	470K		
V21	EZ81 5U4GB	2%Ω	NC	▲	20Ω	NC	90Ω	NC	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
↑ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▲ MEASURED IN "AFC" POSITION.
↑↑ MEASURED FROM PIN 3 OF V12. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)



PREAMPLIFIER CHASSIS PR-2

AMP DPA-5 PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V18 V19	Channel 1 AF Amp. - Channel 2 AF Amp. Channel 1 Output	7025 6AQ5A	V20 V21	Channel 2 Output Rectifier	6AQ5A EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C78A	40	350	24092	PWH4-58-65	C0344	FP428.4	TMQ-79	TVL-3786	
B	40	350			BBR25-25			TVA-1205	
C	20	350							
D	25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C79	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C80	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C81	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C82	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C83	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C84	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C85	.05 600V	Note 1	P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

Note 1. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R86	1meg	
R87	220K	
R88	1200Ω	
R89	470K	
R90	390Ω 1W	

ITEM No.	RATING	REMARKS
R91	18K	
R92	1meg	
R93	220K	
R94	1200Ω	
R95	470K	

ITEM No.	RATING	REMARKS
R96	18K	
R97	22K 1W	
R98	1000Ω 10W	
R99	1000Ω 5W	
R100	10Ω	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T4	117V @ .52A	720VCT @ .060A	6.3V @ 2.3A	89082						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ .3A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4500Ω	3-4Ω	89436D	24S51	A-2930	AU-601	A-3877	24S51	S-3X	
T6	4500Ω	3-4Ω	89436D	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP5	6" x 9"	PM	3-4Ω	83112	69A2	
SP6	6" x 9"	PM	3-4Ω	83112	69A2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Packard-Bell PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M9	63046	13TB *		26S *	S1-1 † S3-1 †			8TA4-S *	N-8TA-S *

* Dual sapphire needles. † Sapphire needle.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Packard-Bell PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M10		W-101STS † or W-102S † or W-101STD † ♦ and W-102MGS † or W-102MGD ♦	E-98 † or E-98 ♦ and E-98X † or E-98XD ♦	† Jewel ♦ Diamond

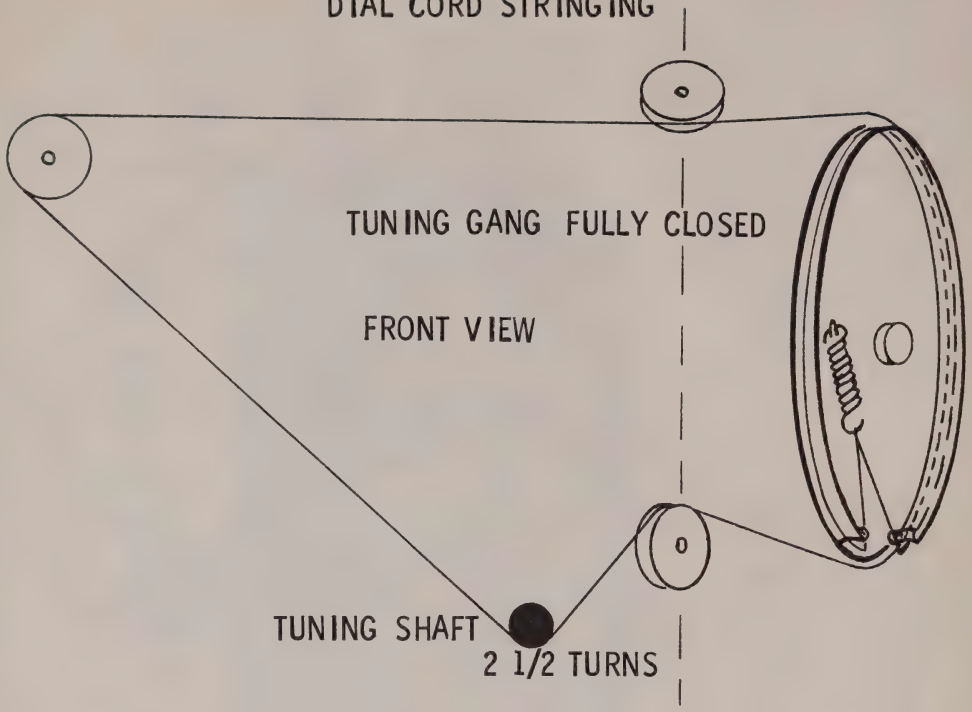
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52266	Tuning (Top), Model RPT-1
Knob	52288A	Tuning (Bottom), Model RPT-1
Knob	52289-3B	Loudness (Top), Model RPT-1
Knob	52287-3A	Loudness (Bottom), Model RPT-1
Knob	52289-2	Bass (Top), Model RPT-1
Knob	52287-2	Bass (Bottom), Model RPT-1
Knob	52289-1	Treble (Top), Model RPT-1
Knob	52287-1	Treble (Bottom), Model RPT-1
Knob	52266-1A	Selector (Top), Model RPT-1
Knob	52288A	Selector (Bottom, Model RPT-1
Knob	52279A	Selector (Top, Models RPC-2, RPC-3
Knob	52284	Selector (Bottom, Models RPC-2, RPC-3
Knob	52277A	Loudness, Bass, Treble (Top), Models RPC-2, RPC-3
Knob	52278A	Loudness, Bass, Treble (Bottom), Models RPC-2, RPC-3
Knob	52289-2A	Loudness, Bass (Top), Model PT-1
Knob	52287-2	Loudness, Bass (Bottom), Model PT-1
Knob	52289-1A	Treble (Top), Model PT-1
Knob	52287-1	Treble (Bottom), Model PT-1
Knob	52266A	Off-On (Top), Model PT-1
Knob	52288A	Off-On (Bottom), Model PT-1

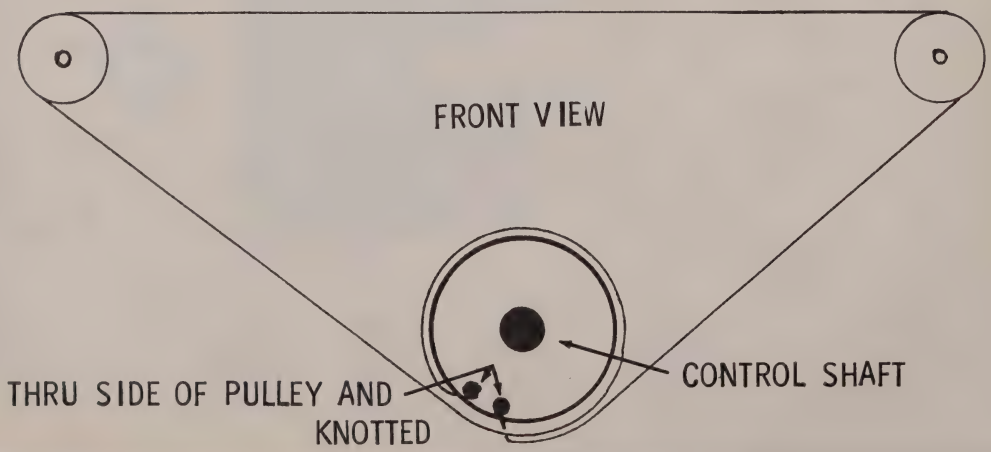
PACKARD-BELL MODELS PT-1, RMS-1, RPC-2, RPC-3, RPT-1, SAC-3(Ch. DPA-5, DPA-20, PR-2, 8TU-1, 9TU-1)

DIAL CORD STRINGING



CORD STRINGING FOR BALANCE, BASS, TREBLE, LOUDNESS AND SELECTOR CONTROLS.

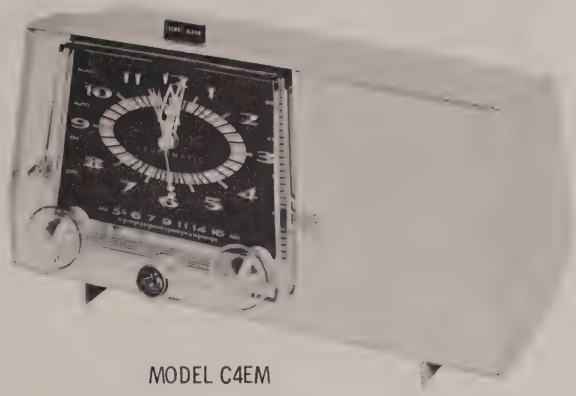
CONTROLS SET AT MINIMUM.



PHOTOFACT® Folder with CIRCUITRACE®

RCA VICTOR MODELS C4E, EM, FE, X4EF, HE, JE (Ch. RC-1191A)

RCA VICTOR MODELS C4E, EM, FE, X4EF, HE, JE (Ch. RC-1191A)



MODEL C4EM

RCA VICTOR MODELS C4E, EM, FE, X4EF, HE, JE (Ch. RC-1191A)

TRADE NAME	RCA Victor Models C-4E, C-4EM, C-4FE (Ch. RC-1191); X-4EF, X-4HE, X-4JE (Ch. RC-1191A)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 5 Tube AM Receiver (C-4 Series Are Clock Versions)
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
RATING	26 Watts, .28 Amp. @117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	535 — 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

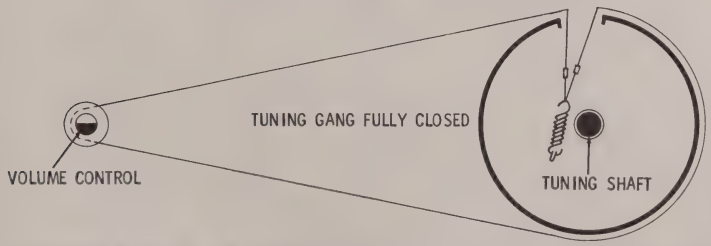
Suggested alignment tools:

A1 thru A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

A7..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	"
4.	"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output while rocking tuning gang. Repeat steps 2, 3, and 4.

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JG579

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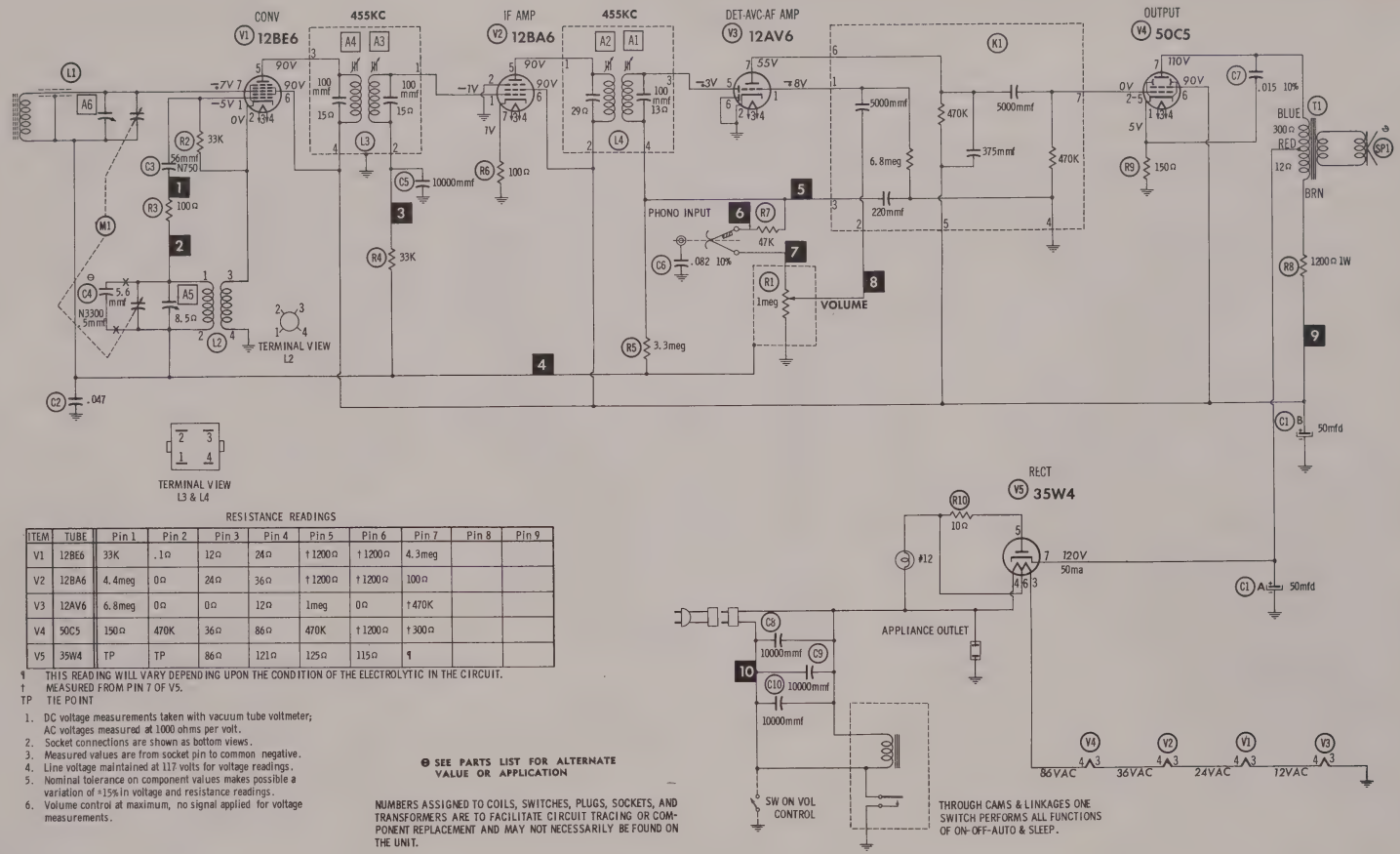
SET 480 FOLDER 10



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BE6	33K	.1Ω	12Ω	24Ω	†1200Ω	†1200Ω	4.3meg		
V2	12BA6	4.4meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	100Ω		
V3	12AV6	6.8meg	0Ω	0Ω	12Ω	1meg	0Ω	†470K		
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1200Ω	†300Ω		
V5	35W4	TP	TP	86Ω	121Ω	125Ω	115Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO & SLEEP.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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RCA VICTOR MODELS C4E, EM, FE, X4EF, HE, JE (Ch. RC-1191A)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆			◆ RAYTHEON ◆ SYLVANIA ◆		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	1F Amplifier	12BA6	V5	Rectifier	35W4
V3	Det. - AVC-AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA VICTOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	W 50	150	108260	PRS2210	BBRD5515	WD215	TDLD-9	TVA-2453	
B	X 50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	56 N750			TCN-56	C10Q56U	CCTN-560 *	CN7-456	10TCU-Q56
C4	5.6 N3300 .5mmf	#103440 ①						
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	.082 400V 10%					6DP-4-823		5BF-S82
C7	.015 400V 10%		V84C4S15-10%		PM6S15	6DP-2-153		4TM-S15
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

① Not used in X-4 Series.
RCA Victor Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA VICTOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	1meg	½	108245					Volume Note 1

Note 1. Chassis RC-1191A uses Part #108226 (with switch).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	100Ω	
R4	33K	

ITEM No.	RATING	REMARKS
R5	3.3meg	
R6	100Ω	
R7	47K	

ITEM No.	RATING	REMARKS
R8	1200Ω 1W	
R9	150Ω	
R10	10Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA VICTOR PART No.	REPLACEMENT DATA
K1	Det. -Audio Coupling	220mmf, 375mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	106989	

PRINTED BOARD

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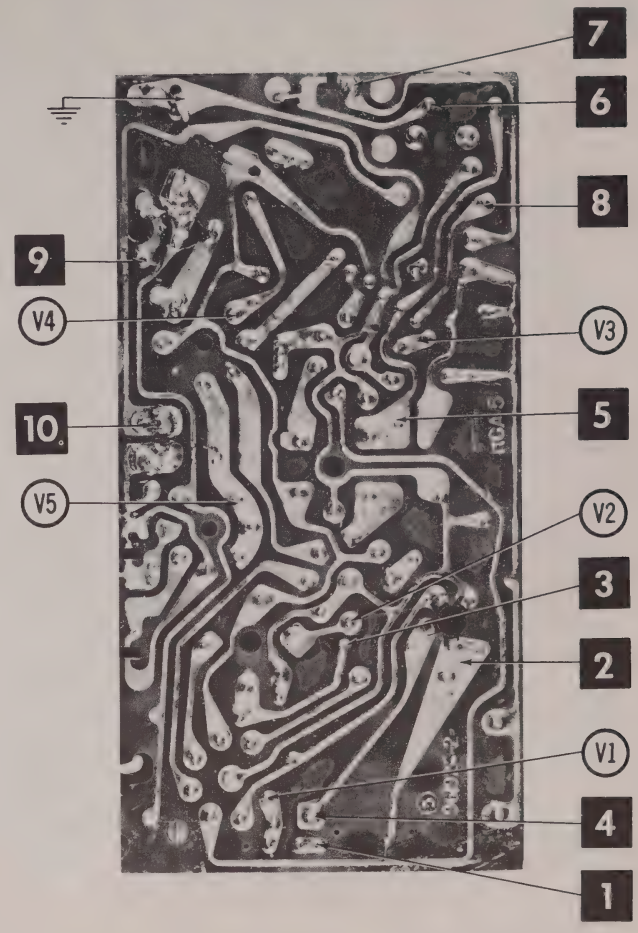
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RCA VICTOR PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	108257						
L2	Osc. Coil	103204						
L3	Input IF	108007	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	108008	16-6780	16-6780	BC-357	13-PC2	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA VICTOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω Tap ⓐ 5% 2400Ω Tap ⓐ 5%	3-4Ω 1-2Ω	79283① 100661②							①Chassis RC-1191 ②Chassis RC-1191A

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA VICTOR PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	① 104099	4A07	① Models C-4E, C-4EM, C-4FE
	4"	PM	3-4Ω	② 103669	4A07	② Models X-4EF, X-4JE, X-4HE
	3½"	PM	3-4Ω	② 108251		

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M1	Tuning Cap.	108244	2 Gang, Models C-4E, C-4EM, C-4FE
	Tuning Cap.	108225	2 Gang, Models X-4JE, X-4EF, X-4HE
	Printed Board	107012	Complete, Less Tuning Cap & Volume Control

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

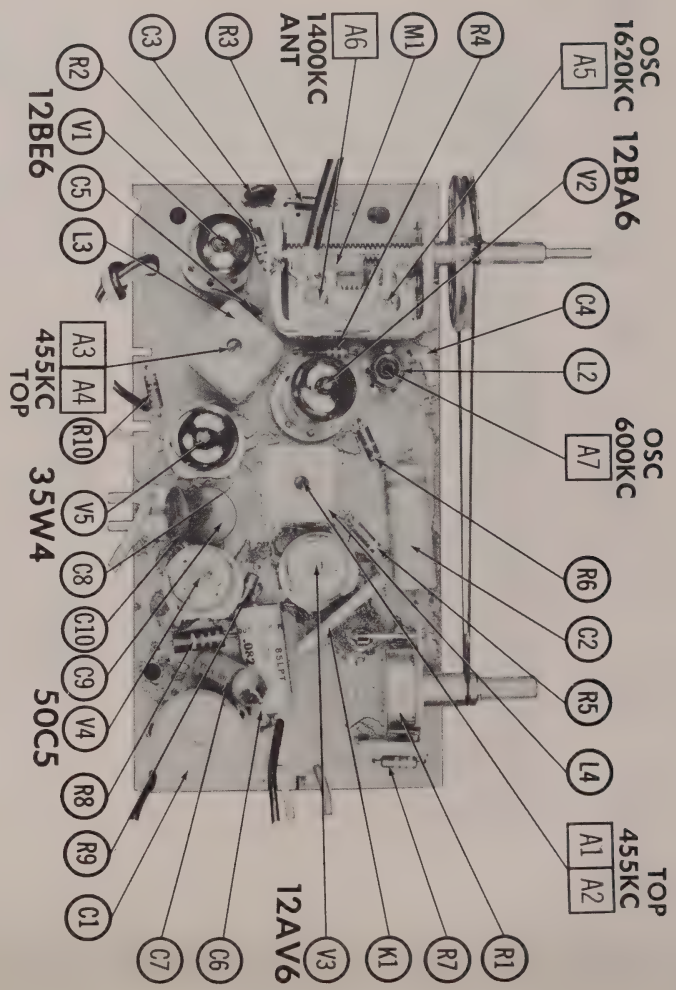
NAME	PART NO.	DESCRIPTION
Knob	108246	Tuning C-4 Series
Knob	108230	Tuning X-4 Series
Knob	108247	Volume C-4 Series
Knob	108227	Volume X-4 Series
Knob	108264	Time Set C-4 Series
Knob	108243	"Drowse" Alarm, C-4 Series
Pointer	108239	C-4 Series
Pointer	108231	X-4 Series
Dial	108232	X-4 Series
Window	108241	Clock, C-4 Series
Cabinet	Y7064	Model C-4E
Cabinet	Y7066	Model C-4EM
Cabinet	Y7065	Model C-4FE
Cabinet	Y7059	Model X-4EF
Cabinet	Y7058	Model X-4JE
Cabinet	Y7060	Model X-4HE

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT® Folder

ROLAND MODEL 51-481 (TW4)

ROLAND MODEL 51-481 (TW4)

ROLAND MODEL 51-481 (TW4)

TRADE NAME	Roland Model 51-481 (TW4)
MANUFACTURER	Roland Radio Corp., a Div. of Herold Radio & Electronics, 716 S. Columbus Ave., Mount Vernon, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540 - 1620KC
RATING	22MA @ 9 Volts DC (No Signal, Min. Volume) 24MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A3, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A4 ..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to Converter base. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	540KC	Tuning gang fully closed	"	A4	"
4.		"	1400KC	Tune to 1400KC signal		A5	"

DISASSEMBLY

1. Remove volume knob by pulling.
2. Move handle to rear of cabinet.
3. Release clips on each side of cabinet. Remove back.
4. Remove battery holder.
5. Remove earphone jack.
6. Remove volume control bracket mounting screw.
7. Remove 4 chassis mounting screws.
8. Slide chassis to bottom of cabinet to clear tuning knob, and remove chassis from cabinet.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JF507

SET 480 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N412	Converter		2N412	2N486	2N412	PNP
X2	2N409	IF Amplifier		2N409	2N483	2N409	PNP
X3	2N406	Detector & AVC		2N406	2N362	2N406	PNP
X4	2N405	Driver		2N405	2N631	2N405	PNP
X5	2N405	Output		2N405	2N631	2N405	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	12	①	SRE12V100	NLW100-12	TT15X100	ML100-15	TE-1135	
C2	10	10	581031	XPP-10010	NLW10-10	TT12X100	ML10-15	TE-1114	
C3	10	10	581031	XPP-10010	NLW10-10	TT12X100	ML10-15	TE-1114	
C4	10	10	②	XPP-10010	NLW10-10	TT12X100	ML10-15	TE-1114	

① Some versions may use 50mfd (Part #581033). ② Some versions may use 10mfd (Part #581031).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-V47
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C12	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B	5000Ω Switch	½	368028				U-12 US-26	Volume Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	18K	Note 1
R3	33K 5%	
R4	4700Ω	
R5	470K	
R6	1000Ω	
R7	5600Ω	

ITEM No.	RATING	REMARKS
R8	1000Ω	
R9	1000Ω	
R10	22K	
R11	15K	
R12	100Ω	
R13	27K	

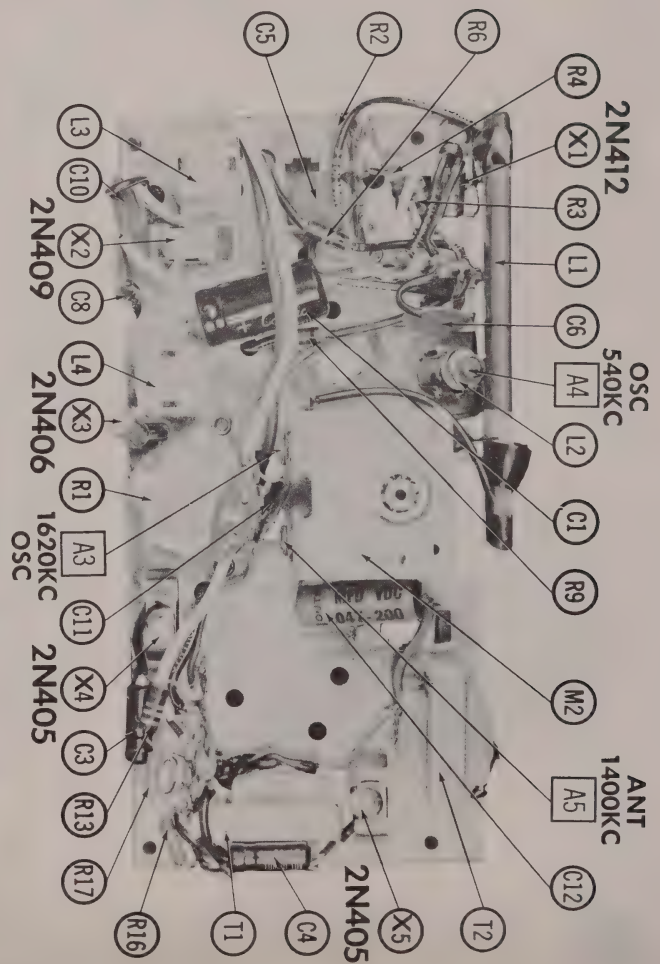
ITEM No.	RATING	REMARKS
R14	1000Ω	
R15	82Ω	
R16	560Ω	
R17	3300Ω	

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ROLAND PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	464029						
L2	Osc. Coil	455076						
L3	Input IF	450024	16-9002	16-9002	BC-321	2041		
L4	Output IF	450025	16-9002	16-9002	BC-323	2042		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4	1	430510						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	325Ω	3-4Ω	430520	TR113 ①			TA-9 ②	TR113 ①	TY-57X ①	①Use original frame. ②Bend taps down. Use 8Ω Sec. tap.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	QUAM PART No.	
SP1	3"	PM	3-4Ω	409008		

BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			Z ①		1015 ①		M-15R ①	① Six required

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M2	Tuning Cap.		2 Gang

CABINETS & CABINET PARTS

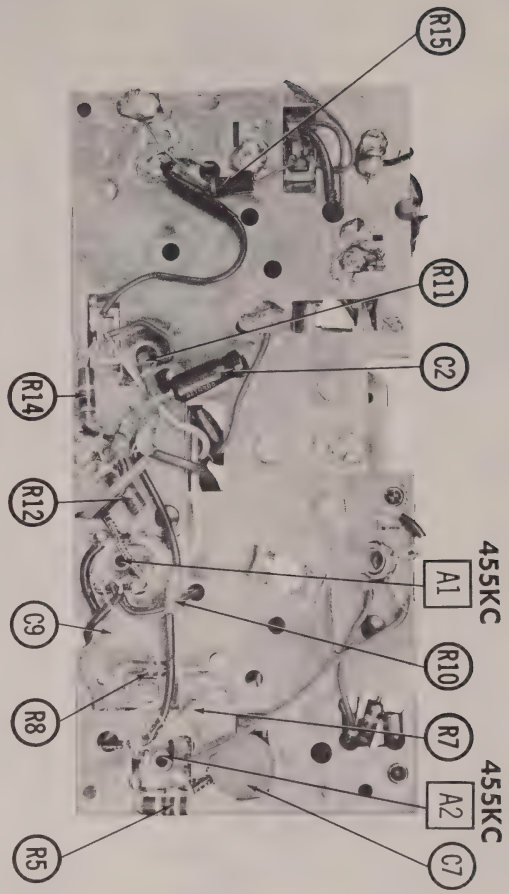
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

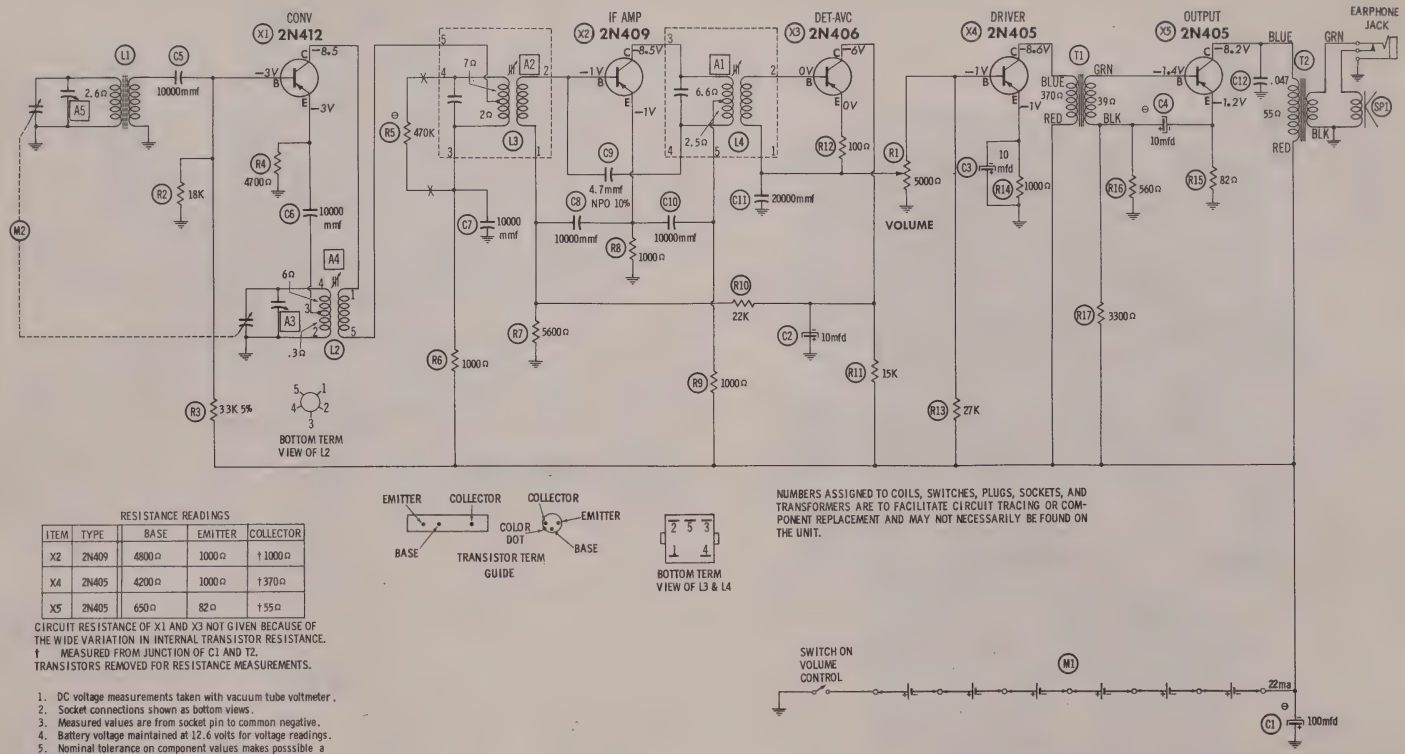
NAME	PART NO.	DESCRIPTION
Knob	272246	Tuning, Red
Knob	270253	Tuning, White
Knob	272254	Tuning, Turquoise
Knob	272249	Volume, Red
Knob	270256	Volume, White
Knob	272257	Volume, Turquoise
Cabinet Front	250240	Red
Cabinet Front	250241	White
Cabinet Front	250242	Turquoise
Cabinet Cover	250250	Red
Cabinet Cover	250251	White
Cabinet Cover	250252	Turquoise
Handle	760967	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X2	2N409	4800Ω	1000Ω	†1000Ω
X4	2N405	4200Ω	1000Ω	†370Ω
X5	2N405	650Ω	82Ω	†55Ω

CIRCUIT RESISTANCE OF X1 AND X3 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF C1 AND T2.
TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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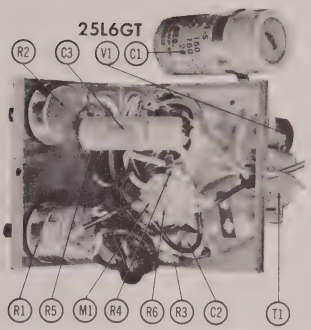
ROLAND MODEL 51-481 (TW4)

PHOTOFACT® Folder

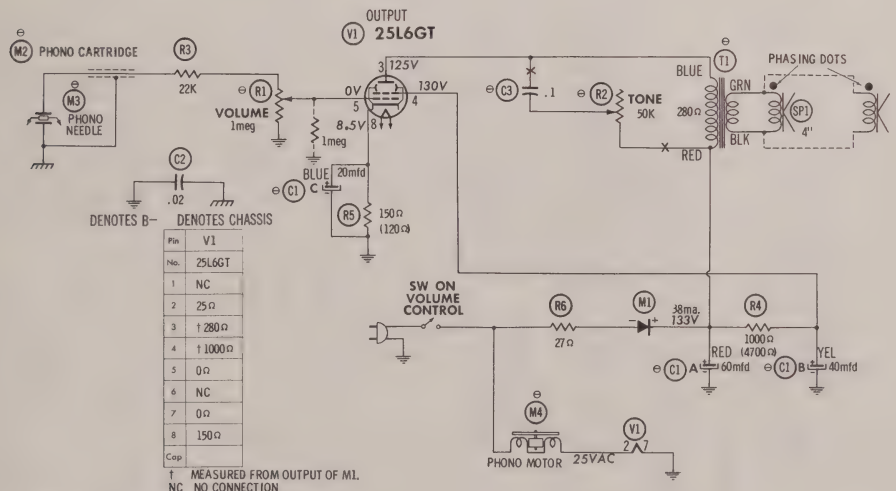
SILVERTONE MODELS 250, 252, 255 (Ch. 528.59330, 331, 350, 351, 360)

SILVERTONE MODELS 250, 252, 255 (Ch. 528.59330, 331, 350, 351, 360)

MODEL 255



TRADE NAME	Silvertone Models 250 (Ch. 528.59330, 528.59331), 252 (Ch. 528.59350, 528.59351), 255 (Ch. 528.59360)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Avenue, Chicago, Illinois
TYPE SET	AC Operated One Tube Phono Amplifier (Models 250, 252 are 4 Speed Manual Record Players Model 255 is a Manual 33-78RPM and Automatic 16-45RPM Record Player)
POWER SUPPLY	105-125 Volts AC, 60 Cycles RATING 44 Watts, .43 Amp. @ 117 Volts AC



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	† 280Ω
4	† 1000Ω
5	0Ω
6	NC
7	0Ω
8	150Ω
Cap	

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

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SET 480 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Output	25L6GT

ITEM No.	USE	TYPE

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	18-51-5	PRS4650	BBRT8415C	TCT3119	TDLT-7	TVA-3455	Note 1
B	40	150							
C	20	20							

Note 1. Part #18-56-5 used in Ch. 528.59330, 331, 350, 351.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C3	.1 200V	Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1

Note 1. Not used in Ch. 528.59330, 331.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2	24-312-0	B-70-S				Volume Note 1
B	Switch			Not Req.				Power Off-On
R2	50K		24-198-2	B-32				Tone Note 2

Note 1. Ch. 528.59330, 31, 50, 51 use Part #24-311-0.
Note 2. Ch. 528.59350, 51 use Part #24-146-2. Not used in Ch. 528.59330, 331.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	22K	
R4	1000Ω	(4700Ω) *

ITEM No.	RATING	REMARKS
R5	150Ω	(120Ω)*

ITEM No.	RATING	REMARKS
R6	27Ω	

* Alternate value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω	3-4Ω	80-103-1	24S48	A-3026	AU-601	A-3877	24S48	S-6X	
	3800Ω	1-2Ω	80-52-1 ①							

① Used in Ch. 528.59350, 351.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	33-348-4	4A07	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.038A	86-16-3 ①	TO65 ①	1234AH ①	65 ①	SR200 ②	① Selenium Type. ② Silicon Type.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	33-316-0 ① 33-308-0 ② 33-312-0 ③	124-TS							

① Model 255 ② Model 250. ③ Model 252.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	83-1255 ① (78RPM)			① Models 255, 252.
	83-1288 ① 83-1258 ② (LP)			② Model 250.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Motor	59-131	Complete ,(Phono Ch. 528.57190)
	Motor	59-130	Complete, (Phono Ch. 528.57191)
	Motor	59-90	Includes Drive Wheel (Ch. 528.59350, 330)
	Motor	59-107	Includes Drive Wheel (Ch. 528.59351, 331)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1226-0	Off-On-Volume, Model 255
Knob	52-830-0	Off-On-Volume, Model 250
Knob	52-775-0	Volume, Tone, Model 252
Knob	52-1227-0	Tone, Model 255
Cabinet	42-84-2	Model 255
Cabinet	42-86-2	Includes Lid, Model 250
Cabinet	42-88-2	Model 252
Handle	49-475	Model 255
Handle	49-267	Model 250
Handle	49-113	Model 252

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**STEELMAN MODELS
2-6511, 2-6531**

STEELMAN MODELS
2-6511, 2-6531

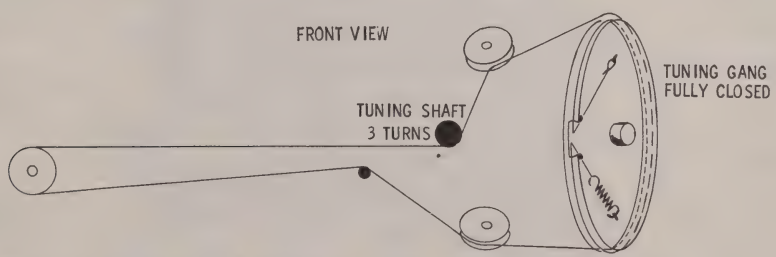
MODEL 2-6531

STEELMAN MODELS
2-6511, 2-6531

TRADE NAME	Steelman Models 2-6511, 2-6531		
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.		
TYPE SET	AC Operated 9 Tube FM-AM Receiver With Stereo Output And 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	50 Watts, .51 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 — 1650KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1200 — PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7

DIAL CORD STRINGING



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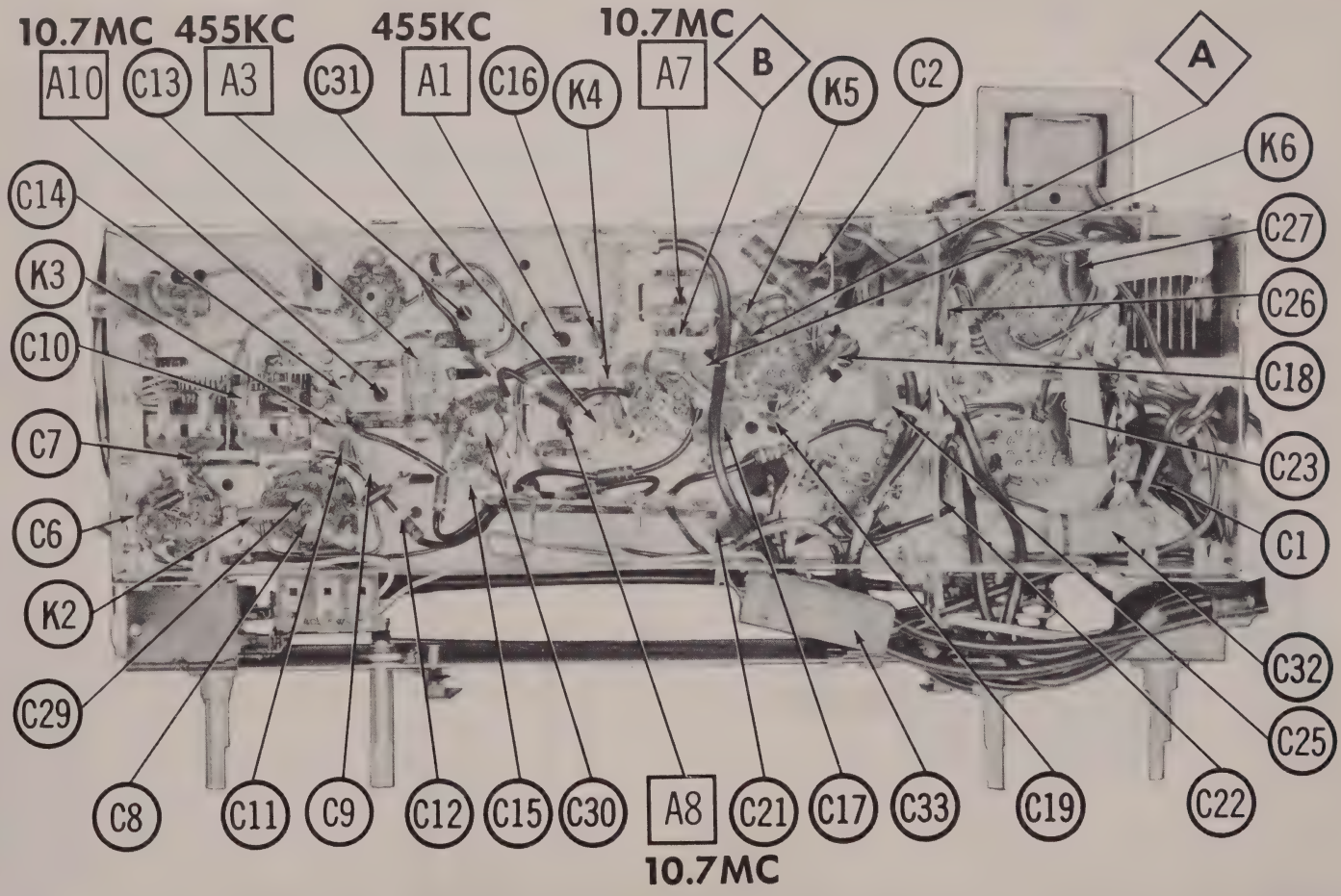
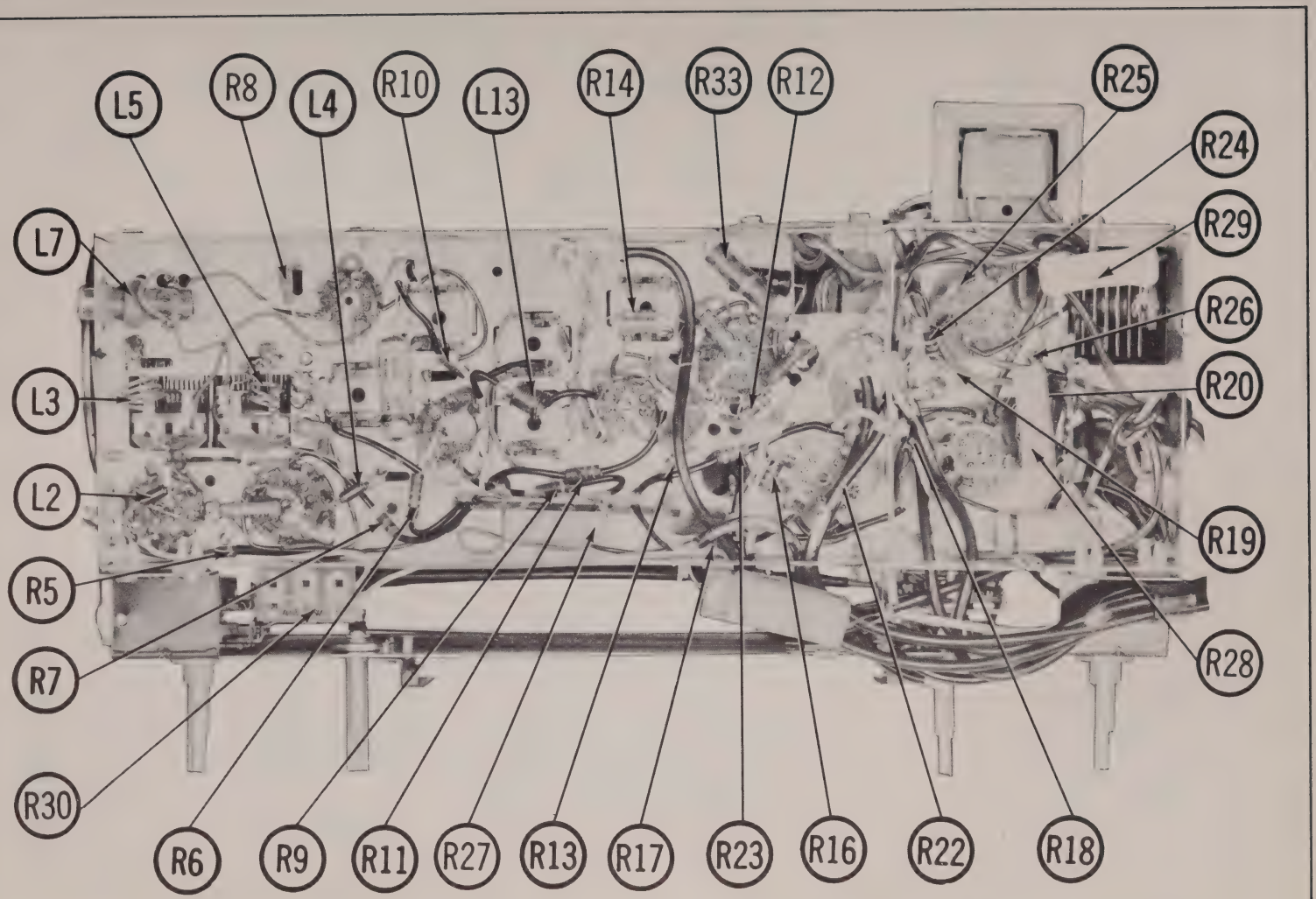
JN566

DATE 4—60

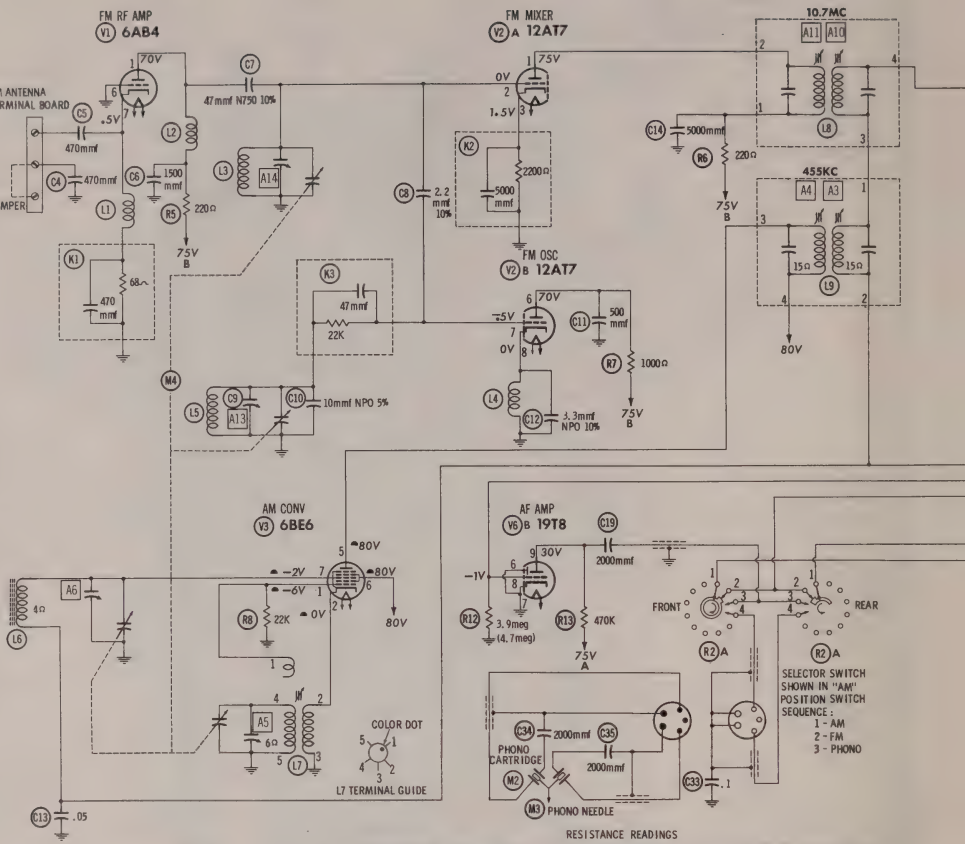
SET 480 FOLDER 13

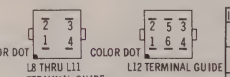


CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & COMBINATION UNIT IDENT.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AB4	†1100Ω	0Ω	30Ω	35Ω	TP	0Ω	68Ω		
V2	12AT7	†1100Ω	0Ω	2200Ω	30Ω	30Ω	†1900Ω	22K	.1Ω	25Ω
V3	6BE6	22K	.8Ω	25Ω	20Ω	†▪1000Ω	†▪1000Ω	▪1.5meg		
V4	6BA6	1.5meg	0Ω	20Ω	18Ω	†1200Ω	†1200Ω	0Ω		
V5	6BA6	470K	0Ω	18Ω	15Ω	†1200Ω	†1200Ω	0Ω		
V6	19T8	INF	22K	INF	15Ω	0Ω	0Ω	0Ω	3.9meg	†470K
V7	12AX7	†470K	3.9meg	0Ω	10Ω	0Ω	†470K	4.7meg	0Ω	5Ω
V8	25EH5	68Ω	470K	110Ω	125Ω	470K	†900Ω	†425Ω		
V9	25EH5	68Ω	470K	135Ω	125Ω	470K	†900Ω	†425Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1.
▪ MEASURED IN "AM" POSITION.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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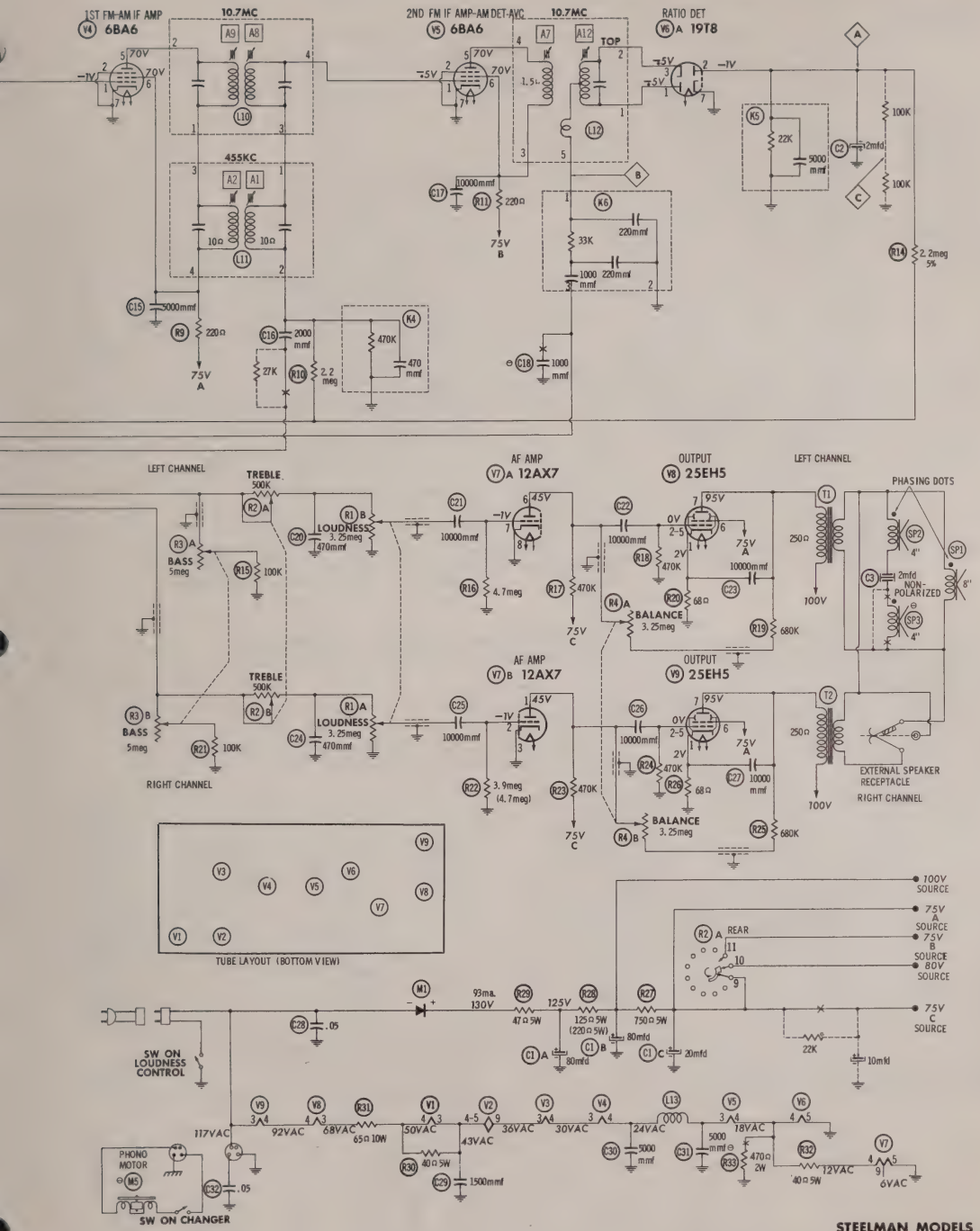

1ST FM-AM IF AMP
V4 6BA6
10.7MC
455KC
2ND FM IF AMP-AM DET-AVC
V5 6BA6
RATIO DET
V6 A 19T8
TOP
LEFT CHANNEL
TREBLE
500K
BASS
5meg
LOUDNESS
3.25meg
470mmf
AF AMP
V7 A 12AX7
OUTPUT
V8 25EH5
BALANCE
3.25meg
PHASING DOTS
NON-POLARIZED
RIGHT CHANNEL
AF AMP
V7 B 12AX7
OUTPUT
V9 25EH5
EXTERNAL SPEAKER
RECEPTACLE
TUBE LAYOUT (BOTTOM VIEW)
100V SOURCE
75V A SOURCE
75V B SOURCE
80V SOURCE
75V C SOURCE
REAR
SW ON LOUDNESS CONTROL
PHONO MOTOR
SW ON CHANGER
117VAC
STEELMAN MODELS
2-6511, 2-6531

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4, A7 thru A12.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A14.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to AM antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output. Repeat steps 2, 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru 200mmf to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (A). Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (B). Common to point (C).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru 200mmf to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A7, A8, A9, A10, A11	Adjust for maximum gain and symmetry of response similar to Fig. 1.
5.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A12	Adjust to place marker at the center of cross-over lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 270Ω in high side.	108MC (Unmod.)	(FM) 108MC	DC probe to point (A). Common to chassis.	A13, A14	Adjust for maximum deflection.
7.	"	90MC	90MC	"	L3, L5	Adjust for maximum deflection by compressing or expanding coil turns. Repeat step 6.

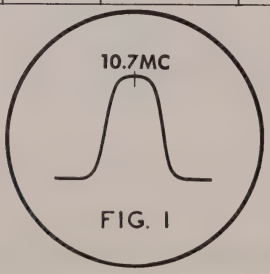


FIG. 1

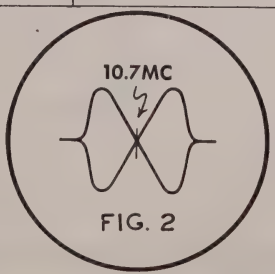


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6AB4
V2	FM Mixer-Osc.	12AT7
V3	AM Converter	6BE6
V4	1st FM-AM IF Amp.	6BA6
V5	2nd FM IF Amp-AM Det. -AVC	6BA6
V6	Ratio Det. -AF Amp.	19T8
V7	Left Channel AF Amp-Right Channel AF Amp.	12AX7
V8	Left Channel Output	25EH5
V9	Right Channel Output	25EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	583021	PR4-250	BBRQ0926.5	WQ410	TDLD-13	TVA-4708	
B	80	150					TD-20-150		
C	20	150							
C2	2	50	581036	SRE50V2	NLW2-100	TC302	ML2-50	TE-1301	
C3	2	50NP	581018	NP-PRS7400	BBR4-50 †	TCN502		TVAS-1301.1 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

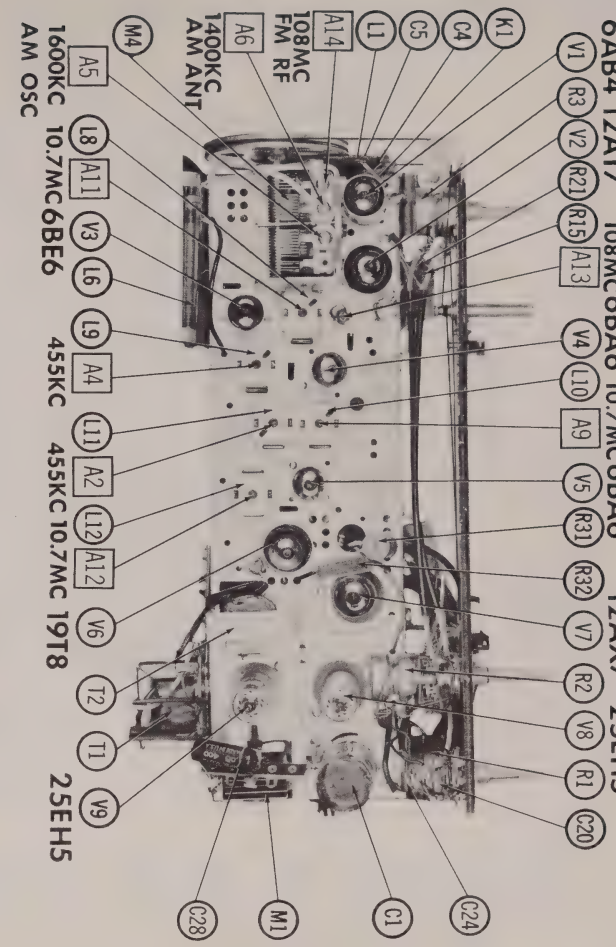
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C5	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C6	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C7	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C8	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C9								
C10	10 NPO 5%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C11	500		SI 500	DD-501	BYA10T5	CCD-501	GP350	10TS-T50
C12	3.3 NPO 10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C13	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C16	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C19	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP210	5HK-D20
C20	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C24	470		BPD-00047	DD-470	BYA10T47	CCD-471	GP347	10TS-T47
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C29	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C32	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C33	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C34	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C35	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg		368042	B-85			FC36A	Loudness, Right Channel
B	3.25meg			SR-85			RU36A	Loudness, Left Channel
C	Shaft			Not Req.			CS3500	
D	Switch			KR-1			US41	Power On-Off
R2A	Switch		368041					Function Selector Switch
B	500K							Treble, Right Channel
C	500K							Treble, Left Channel
R3A	5meg		368040	B-88			FA56A	Bass, Left Channel
B	5meg			SR-88			RU56A	Bass, Right Channel
C	Shaft			Not Req.			CS3500	
R4A	3.25meg		368039	B-84			FA36L	Balance, Left Channel
B	3.25meg			SR-84			RU36L	Balance, Right Channel
C	Shaft			Not Req.			CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	220Ω	
R6	220Ω	
R7	1000Ω	
R8	22K	
R9	220Ω	
R10	2.2meg	
R11	220Ω	
R12	3.9meg	(4.7meg) *
R13	470K	
R14	2.2meg 5%	

ITEM No.	RATING	REMARKS
R15	100K	
R16	4.7meg	
R17	470K	
R18	470K	
R19	680K	
R20	68Ω	
R21	100K	
R22	3.9meg	(4.7meg) *
R23	470K	
R24	470K	

ITEM No.	RATING	REMARKS
R25	680K	
R26	68Ω	
R27	750Ω 5W	
R28	125Ω 5W	(220Ω 5W)*
R29	47Ω 5W	
R30	40Ω 5W	
R31	65Ω 10W	
R32	40Ω 5W	
R33	470Ω 2W	Note 1

* Alternate Value.

Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	STEELMAN PART No.	REPLACEMENT DATA
K1	FM Antenna Filter	470mmf, 68Ω	420013	
K2	FM Mixer Cathode	5000mmf, 2200Ω	420016	
K3	FM Osc. Grid	47mmf, 22K	420019	
K4	AM Audio Filter	470mmf, 470K	420014	Centralab RC-465 Sprague PRC-3
K5	Ratio Detector Plate	5000mmf, 22K	420015	
K6	FM Audio Filter	(2) 220mmf, 1000mmf, 33K	420017	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA STEELMAN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	455077						1.7uh
L2	RF Choke	455077						1.7uh
L3	FM RF Coil	455079						1.7uh
L4	Cathode Choke	455077						
L5	FM Osc. Coil	455078						
L6	Loopstick	464030						
L7	AM Osc. Coil	455080						
L8	1st FM IF Trans.	450005	16-3487	16-3487	FM-254	1463		
L9	1st AM IF Trans.	450023	16-6758	16-6758	FM-254	12-C1	RF-1	
L10	2nd FM IF Trans.	450005	16-3487	16-3487	BC-352	1463		
L11	2nd AM IF Trans.	450013	16-6758	16-6758	BC-353	12-C2	RF-2	
L12	Ratio Det.	450006	17-3498	17-3498	FM-255	1465		
L13	Fil. Choke	455081	19-1001	19-1001	BC-562	4604		1.4uh

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2800Ω	3-4Ω	430566	22S46	A-2928	AU-603	A-3876	22S46	S-1X	
T2	2800Ω	3-4Ω	430566	22S46	A-2928	AU-603	A-3876	22S46	S-1X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	408001	7A31	① Not used in Model 2-6511
SP2	4"	PM	4-5Ω	404009	4AITZ4.7	
SP3	4"	PM	4-5Ω	①404009	4AITZ4.7	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.093A	* ①	① T150	① 1235AH	① 150A	① SR200	① Selenium Type

* Silicon type may be used in some versions (Part #380019).

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	324513	80TS		66 *				8TA4-S	N-8TA-S

* Use mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-104STS † or W-104STD ♦	CRA-57 † or CRA-57D ♦	† Jewel ♦ Diamond
		W-104MGS † or W-104MGD ♦	CRA-57LP † or CRA-57LPD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M4	Tuning Cap.	590053	2 Gang (Ant.: 30-320mmf)
M5	Motor	016945	Model 2-6531
	Motor	008059	Model 2-6511
	Speaker System	2-0851	Stereo, Model 2-6511
	Speaker System	2-0861	Stereo, Model 2-6531

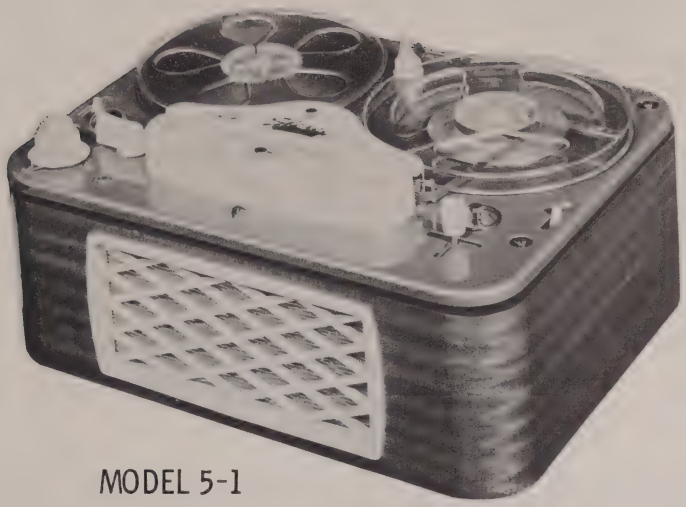
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

TANDBERG MODELS 5, 5-1, 5-2, 5-2-266, 5-3, 241

TANDBERG MODELS 5, 5-1, 5-2, 5-2-266, 5-3, 241



MODEL 5-1

TANDBERG MODELS 5, 5-1, 5-2, 5-2-266, 5-3, 241

FOR SERVICE INFORMATION ON THE TRANSPORT MECHANISM SEE PHOTOFACT SET 433 FOLDER 13.

TRADE NAME	Tandberg Models 5, 5-1, 5-2, 5-2-226, 5-3, 241
IMPORTER	Tandberg of America, Inc., 8 Third Ave., Pelham, N. Y.
TYPE SET	AC Operated 7 Tube Tape Recorder Amplifier
POWER SUPPLY	110/125/145/200/220/245 Volts AC, 50-60 Cycles RATING 90 Watts, .8 Amp. @ 117 Volts AC

ADJUSTMENTS

OSCILLATOR AND BIAS ADJUSTMENTS

Adjust A1 for an oscillator frequency of 66.66KC.

Connect an RF VTVM across one of the record heads and adjust A2 for minimum meter deflection (approx. 5V). Connect the RF VTVM across one of the erase heads. Set stereo switch to Stereo position. Adjust A3 for maximum meter deflection (160-200V). The voltage across the other erase head should be approximately the same.

Connect a 1000Ω resistor in series with the upper head. Connect an RF VTVM across the resistor. Set the selector switch to Monaural. Adjust R4 for .4 volt. Remove the resistor and connect in series with the lower head. Switch to Extra and adjust R5 for .4 volt.

A4 is adjusted to minimize the second harmonic (133.66KC) in the bias current.

RECORD LEVEL INDICATOR ADJUSTMENT

Connect an audio generator to the recorder input terminals. Insert a 1000Ω resistor in series with the upper record head, and connect a VTVM across the resistor. With the generator output set for 90-110 millivolts as indicated on the VTVM, adjust R3 for maximum shadow on the Level Indicator.

SET 480 FOLDER 14

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

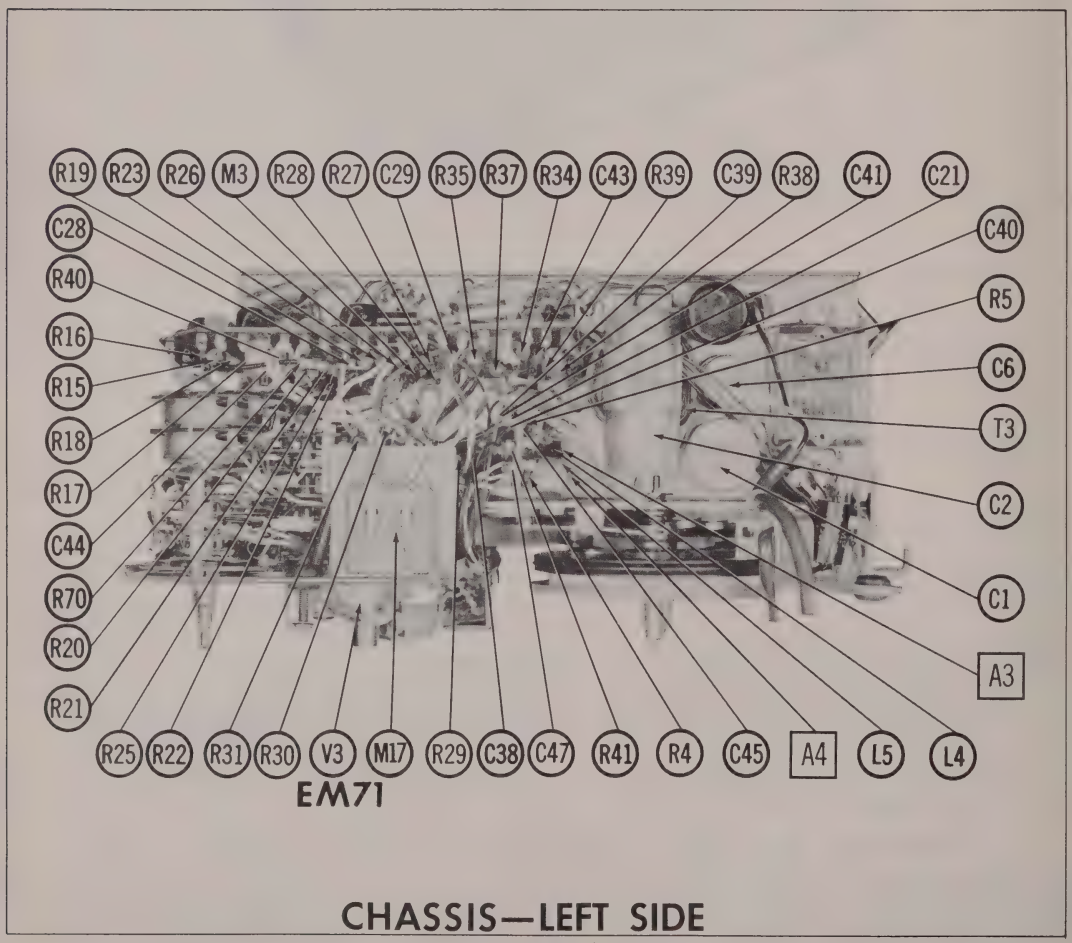
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JQ530

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

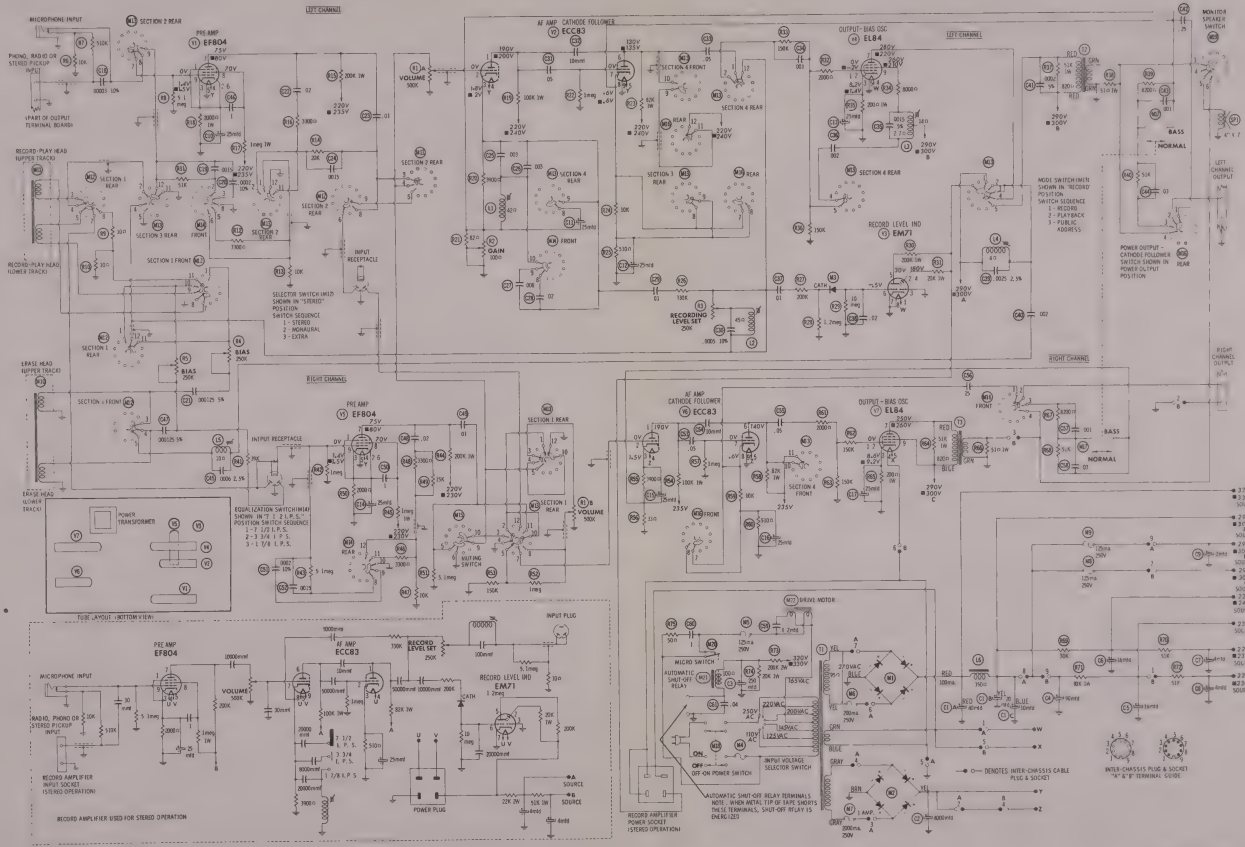
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF804	2000Ω	2000Ω	2000Ω	1.2Ω	0Ω	2000Ω	†280K	†1.1meg	300Ω ■10K
V2	ECC83	†130K	0Ω	4000Ω	1.2Ω	1.2Ω	†30K	1meg	10K	0Ω
V3	EM71	.2Ω	†■20K	0Ω	†■20K	■200K	10meg	0Ω	0Ω	
V4	EL84	150K	150K	200Ω	.2Ω	0Ω	NC	†1150Ω	NC	†8300Ω
V5	EF804	2000Ω	2000Ω	2000Ω	1.3Ω	0Ω	2000Ω	†280K	†1meg	300Ω
V6	ECC83	†130K	0Ω ■150K	3900Ω	1.3Ω	1.3Ω	†■30K †110K	1meg	10K ■510Ω	0Ω
V7	EL84	150K	150K	200Ω	0Ω	.1Ω	NC	†1200Ω	NC	†350Ω

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1.
■ MEASURED IN "RECORD" POSITION.
NC NO CONNECTION



CHASSIS—LEFT SIDE



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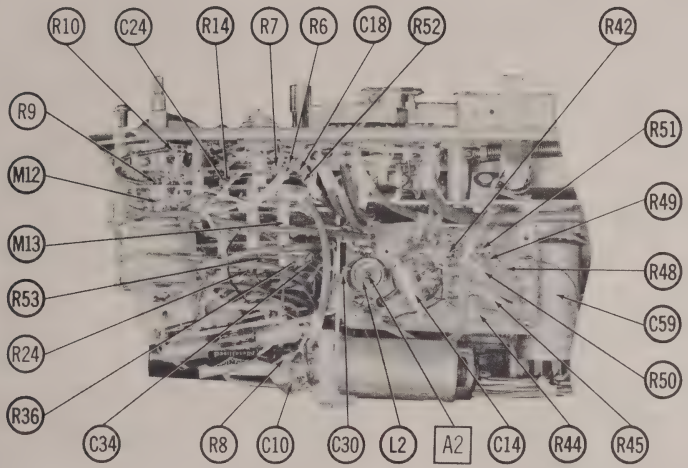
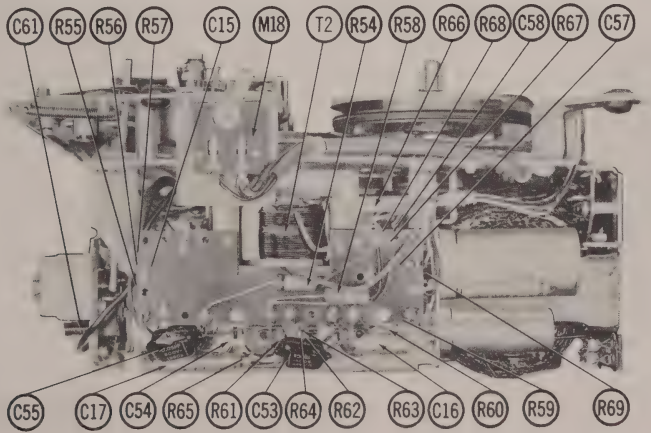
*Howard W. Sams & Co., Inc. 1960

TANDBERG MODELS 5, 5-1, 5-2, 5-2-266, 5-3, 241

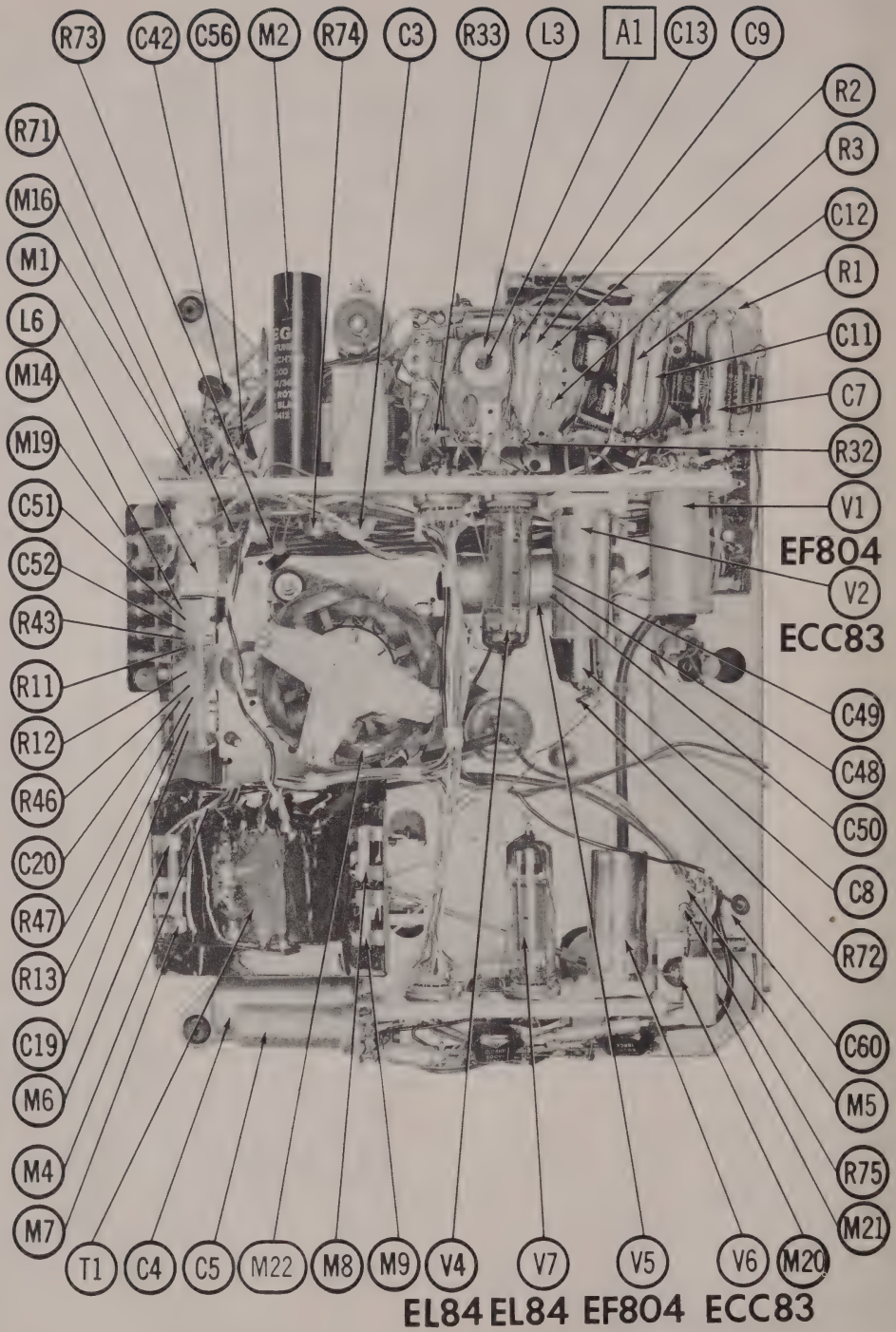
SUBCHASSIS



CHASSIS - END VIEW



CHASSIS - RIGHT SIDE



CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Left Channel Preamp.	EF804
V2	Left Channel AF Amp. - Cathode Follower	ECC83
V3	Record Level Indicator	EM71
V4	Left Channel Output - Bias Osc.	EL84
V5	Right Channel Preamp.	EF804
V6	Right Channel AF Amp. - Cathode Follower	ECC83
V7	Right Channel Output	EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TANDBERG PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	350	160.15	AFH3-123-30	C0225	FP333.5	TMD-37	TVL-2628	
B	20	350							
C	10	350							
C2	4000	6	160.18		BR20001 BR20001		TD-2000-6 TD-2000-6		
C3	250	30		PRS1380	BR2505	TC50025	TD-250-50	TVA-1312	
C4	90	350	160.24	PRS1790	BR10035	FP187	TD-100-450	TVA-1718	
C5	16	350	160.23	PRS1640	BR1635	TC64	TD-16-350	TVA-1607	
C6	16	350	160.5	PRS1640	BR1635	TC64	TD-16-350	TVA-1607	
C7	4	350	160.6	PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C8	4	350	160.6	PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C9	2	350	160.27	PRS1705	BR245	TC595	TD-2-450	TVA-1701	
C10	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C11	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C12	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C13	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C14	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C15	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C16	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	
C17	25	12	160.4	XPP-12025	NLW30-15	TT25X25	TD-25-25	TE-1157.1	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C18	.000030 125V 10%			DD-300	L10Q3	CCD-300	GP430	10TS-Q30
C19	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C20	.0002 125V 10%				FM6T2	CCD-200	GP320	10TS-T20
C21	.000125 500V 5%			TCZ-130	22R5T13	CM-20B-131J		MS-313
C22	.02 350V		P488N-02	D6-203	CUB4S2	4DP-1-203	GEM-412	4TM-S2
C23	.01 400V		P488N-01	DD-103	CUB4S1	4DP-2-103	GEM-411	4TM-S1
C24	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C25	.003 400V		P688N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C26	.003 400V		P688N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C27	.008 500V		P688N-008	DD-822	CUB16D8	6DP-2-802	GEM-628	6TM-D8
C28	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S2
C29	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C30	.0005 125V 10%			D6-501	PM6T5	CM-20B-501K	GP350	10TS-T50
C31	.05 500V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C32	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C33	.05 500V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C34	.001 125V		P288N-001	D6-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C35	.0015 500V 5%				1R5D15	CM-20B-152J	MCE 456	MS-215
C36	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C37	.01 400V		P488N-01	D6-103	CUB4S1	4DP-3-103	GEM-412	4TM-S1
C38	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S2
C39	.0025 500V 2.5%	#160.9					MCE 460	
C40	.002 500V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C41	.0002 500V 5%				22R5T2	CM-20B-201J	MCE 237	MS-320
C42	.25 150V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	.001 125V		P288N-001	D6-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C44	.03 400V		P488N-03	DD-303	CUB6S3	4DP-2-203	GEM-413	4TM-S3
C45	.0006 125V 2.5%	#160.11						
C46	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C47	.000125 500V 5%			TCZ-130	22R5T13	CM-20B-131J		MS-313
C48	.02 350V		P488N-02	D6-203	CUB4S2	4DP-1-203	GEM-412	4TM-S2
C49	.01 400V		P688N-01	DD-103	CUB6S1	4DP-2-103	GEM-411	4TM-S1
C50	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C51	.0002 125V 10%				22R5T2	CM-20B-201K	GP320	10TS-T20
C52	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C53	.05 500V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C54	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C55	.05 500V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C56	.25 150V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C57	.001 125V		P288N-001	D6-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C58	.03 400V		P488N-03	DD-303	CUB6S3	4DP-2-303	GEM-413	4TM-S3
C59	1.2mfd 380V		P92ZN-1.0		MP2W1		GEM-21	118P10502S2
C60	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C61	.04 150V		P288N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S4

Tandberg Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TANDBERG PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		155.4					Volume, Left Channel
B	500K							Volume, Right Channel
R2	100Ω		155.10					Gain, Left Channel
R3	250K		155.6					Recording Level Set
R4	250K		155.6					Bias, Left Erase Head
R5	250K		155.6					Bias, Right Erase Head

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	10K	
R7	510K	
R8	5.1meg	
R9	10Ω	
R10	10Ω	
R11	51K	
R12	3300Ω	
R13	10K	
R14	20K	
R15	200K 1W	
R16	3300Ω	
R17	1meg 1W	
R18	2000Ω 1W	
R19	100K 1W	
R20	3900Ω	
R21	82Ω	
R22	1meg	
R23	82K 1W	
R24	10K	
R25	510Ω	
R26	330K	
R27	200K	
R28	1.2meg	
R29	10meg	

ITEM No.	RATING	REMARKS
R30	200K 1W	
R31	20K 1W	
R32	2000Ω	
R33	150K	
R34	8000Ω	
R35	200Ω 1W	
R36	150K	
R37	51K 1W	
R38	5Ω 1W	
R39	8200Ω	
R40	51K	
R41	39K	
R42	1meg	
R43	5.1meg	
R44	200K 1W	
R45	1meg 1W	
R46	3300Ω	
R47	10K	
R48	3300Ω	
R49	15K	
R50	2000Ω	
R51	5.1meg	
R52	1meg	
R53	150K	

ITEM No.	RATING	REMARKS
R54	100K 1W	
R55	3900Ω	
R56	33Ω	
R57	1meg	
R58	62K 1W	
R59	10K	
R60	510Ω	
R61	2000Ω	
R62	150K	
R63	150K	
R64	51K 1W	
R65	200Ω 1W	
R66	51Ω 1W	
R67	8200Ω	
R68	51K	
R69	30K	
R70	51K	
R71	30K 1W	
R72	51K	
R73	200K 2W	
R74	20K 1W	
R75	50Ω	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TANDBERG PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Tone Compensation Coil							
L2	Bias Freq. Trap	137.1						
L3	Bias Osc.	137.3						
L4	Plate Coil	137.2						
L5	2nd Harmonic Trap Coil	137.4						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	TANDBERG PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	.080A	350Ω	8.5HY	137.5						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TANDBERG PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	245V Tap② 220V, 200V 165V, 145V 125V, 110V @ .62A	270VAC @ .100A	7VAC @1A	110.12						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @2.1A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TANDBERG PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9000Ω	3-4Ω	129.1	24S12	A-2902①	AU-606	A-3824①	24S12	S-15X①	① Drill new mounting hole
T3	9000Ω	3-4Ω	129.1	24S12	A-2902①	AU-606	A-3824①	24S12	S-15X①	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TANDBERG PART No.	QUAM PART No.	
SP1	4"x 7"	PM	3-4Ω	129.51		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	TANDBERG PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.100A	① 111.2					① Selenium Type
M2	1.0A	① 111.22					
M3		① 111.41					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TANDBERG PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4			①112.1					
M5		125MA 250V	112.3					
M6		200MA 250V	112.6					
M7		2000MA 250V	112.10				GMA 2	
M8		125MA 250V	112.2				GMA 1/8	
M9		125MA 250V	112.2				GMA 1/8	

① Coil of wire.

MISCELLANEOUS

ITEM No.	PART NAME	TANDBERG PART No.	NOTES
M10	Erase Head	125.53	4 Track
M11	Record-Play Head	125.4	4 Track
M12	Switch	133.72	Function
M13	Switch	132.26	Mode
M14	Switch	135.7	Equalization
M15	Switch	134.86	Muting
M16	Switch	134.71	Power Output, Cathode Follower
M17	Switch	134-1	Normal-Bass
M18	Switch	134-1	Power Off-On
M19	Switch	134-26	Monitor-Speaker
M20	Switch	134.41	Micro
M21	Relay	140.4	Stop (Automatic Shut Off)
M22	Motor	115.3	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	107.2	Volume
Knob	107.21	Mode Switch
Knob	107.31	Speed Selector
Knob	107.41	Operating Lever
Knob	107.51	Off-On, Bass Switch
Cabinet	100.21	Model 5 Series
Top Plate	101.31	Metal
Head Cover	102.31	Rear (Plastic)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

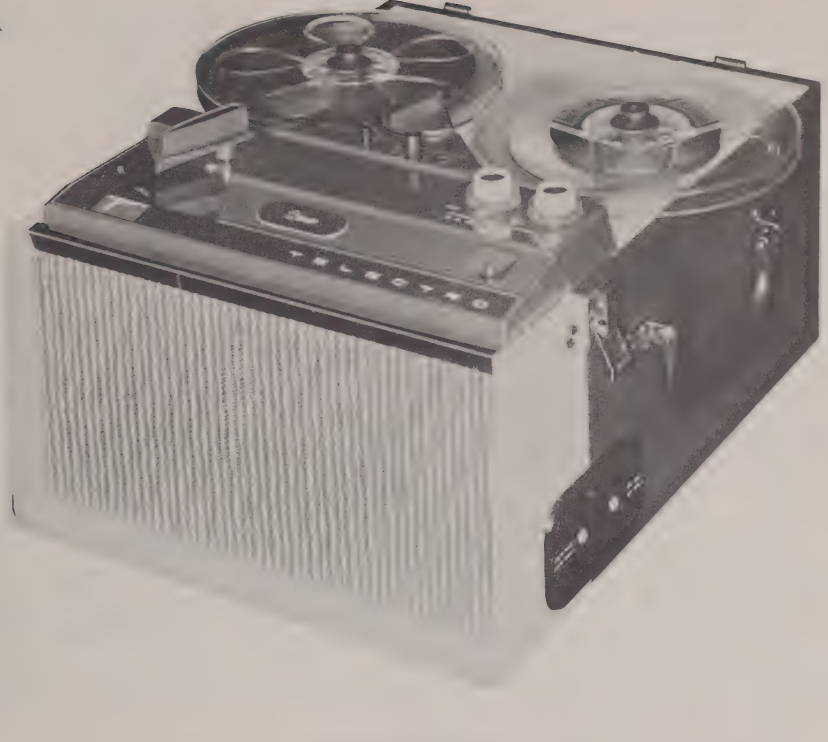
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

TELECTRO
MODEL 1980

TELECTRO
MODEL 1980



TELECTRO
MODEL 1980

GENERAL INFORMATION

Telectro Model 1980 is a two-speed tape player. It will play back dual-track monaural, dual-track stereo, and four-track stereo prerecorded tapes. The two speeds are 3 3/4 and 7 1/2 ips.

The Telectro Model 1980 may be used as a public-address system as well as a tape player.

When both tracks of a monaural prerecorded tape are used, the playing times are as follows:

Reel Size	3 3/4 Ips	7 1/2 Ips
3" (300 ft.)	1/2 hour	1/4 hour
5" (600 ft.)	1 hour	1/2 hour

Connect this player to an outlet supplying 110-120 volts, 60 cycles AC only. Before connecting to a line supply, be sure it agrees with these specifications.

Manufactured by:

Telectronic Corporation
35-18 37th Street
Long Island City, New York

SET 480 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ422

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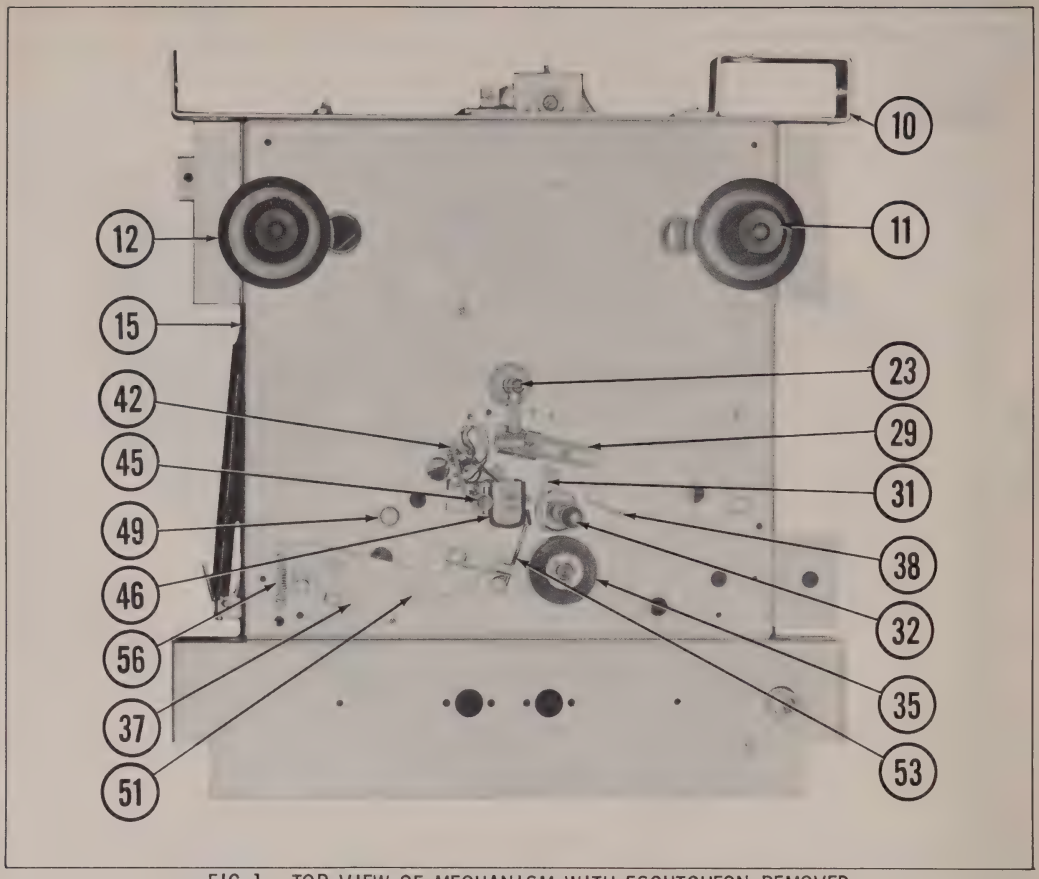


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

PREPARING FOR OPERATION

1. Open the cover and remove the power cord, empty reel, and reel of tape from the storage space at the rear of the unit.
2. Remove the cover by unlocking the hinges. Place the unit so that the controls are accessible and at a convenient height.
3. Plug the power cord into any AC outlet that has the proper frequency and power requirements.
4. The recorder is now ready for use. Before operating it, the operator should familiarize himself with the controls.

FUNCTION OF CONTROLS

Power On-Off and Volume Control 1

Turning this control until a click is heard turns the power on to the unit. Further rotation of this control increases the volume for channel 1.

Volume Control 2

Rotating this control clockwise increases the volume for channel 2.

Tone Controls 1 and 2

Rotating these controls clockwise increases the trebles (highs); counterclockwise, increases the bass (lows).

Function

Idle is the neutral, or stationary, tape position. Turning the knob to the left, to the Play position, puts the tape in motion.

CAUTION: When not using the tape player, place the Function selector knob in the Idle position.

Head Elevator

When this control is down, the head is set for dual-track monaural and two-track stereo tapes. When it is up, the head is set for four-track stereo tapes.

Wind-Rewind

Turn this control to the right for fast wind; to the left for fast rewind. The Function selector knob must be placed in Idle before the Wind-Rewind knob is operated.

Speed Change

For 7 1/2 ips, place the Speed Change control in the down position; for 3 3/4 ips, in the up position. Do not change speeds unless the Function selector knob is in Idle.

OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the left (supply) spindle, and an empty reel on the right (take-up) spindle. Make sure the reel slots engage the pins on the spindle.
2. Unwind approximately twelve inches of tape from the left (supply) reel. Hold a section of tape taut, and insert it into the tape slot. Make sure the dull-coated side of the tape faces the rear of the unit.
3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns clockwise, until the tape is secured to the reel and all slack is taken up between reels.

To Wind or Rewind Tape

1. Turn the Function selector knob to Idle.
2. To wind the tape onto the reel, turn the Wind-Rewind control to the right, and hold. Release the knob when the desired section of the tape is reached.
3. To rewind the tape, turn the Wind-Rewind control to the left. It will lock into position. To stop the rewind, return the Wind-Rewind knob to the center.

To Play a Monaural Recording

1. Connect an external speaker to external speaker jack 1.
2. Thread the tape (see "Threading the Tape").
3. Make sure the Head Elevator is down.
4. Connect the tape player to an AC outlet of proper rating.
5. Turn on the unit by rotating the Power On-Off-Volume control 1 until a click is heard.
6. Turn the Function control to the Play position.
7. Turn the Volume control until the desired volume is attained.
8. Turn Tone control 1 clockwise to the desired listening level.

To Play a Stereo Recording

1. Connect two external speakers to External Speaker jacks 1 and 2.
2. Thread the tape (see "Threading the Tape").
3. For two-track stereo, make sure the Head Elevator is down. For four-track stereo, make sure it is up.
4. Connect the tape player to any AC outlet of proper rating.
5. Turn the unit on by turning the Power On-Off-Volume control 1 until a click is heard.
6. Turn the Function control to the Play position.
7. Rotate Volume controls 1 and 2 clockwise to increase the volume.
8. Turn Tone control 1 and 2 clockwise to the desired listening level.

Splicing the Tape

1. Overlap the broken ends and cut at a 45-degree angle.
2. Butt the two ends together, with the glossy side up.
3. Tape the butted ends together with splicing tape.
4. Trim off the excess splicing tape.

To Use Unit as a Public-Address System

1. Plug the unit into an AC outlet of the proper rating.
2. Turn the unit on by turning the Power On-Off-Volume control 1 until a click is heard.
3. Plug a microphone into the upper Phono jack.
4. Connect an external speaker into the upper External Speaker jack.
5. Readjust Volume control 1 to the desired sound level.

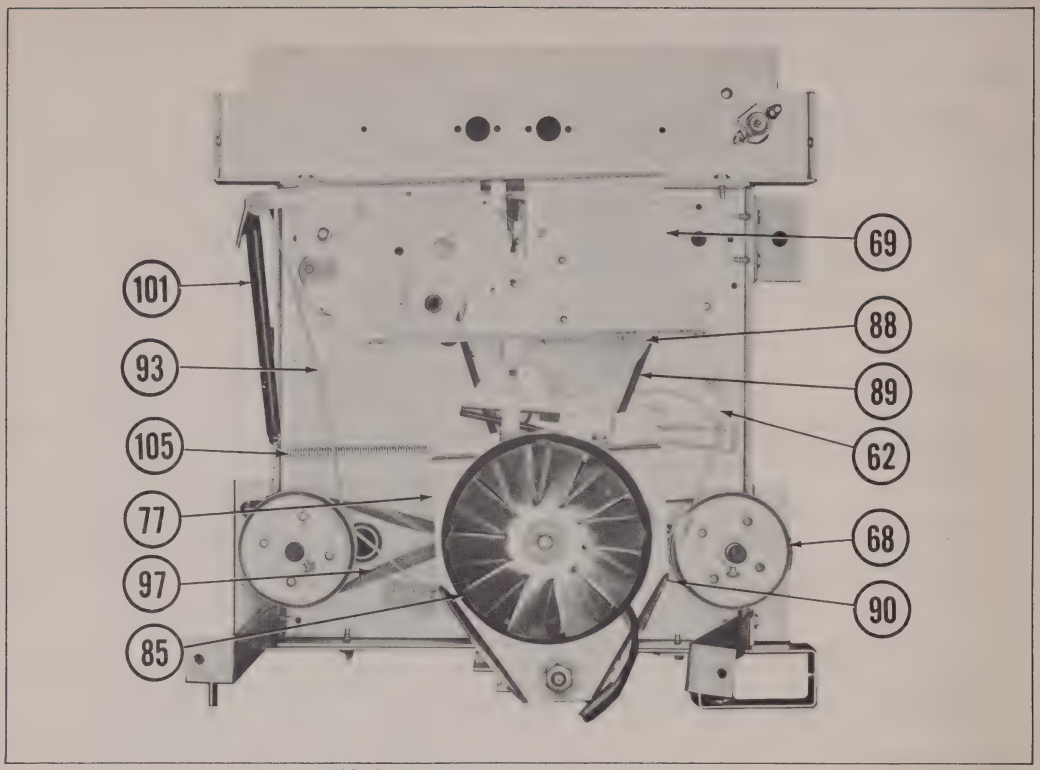


FIG. 2 BOTTOM VIEW OF MECHANISM

DISASSEMBLY

To Remove Tape Player from Cabinet

1. Remove the four screws from the bottom of the cabinet.
2. Remove the four screws (two on each side) on the side of the cabinet.
3. Remove the two screws holding the jack plate, on the side of the cabinet.
4. Lift the unit from the cabinet.
5. To reassemble, reverse the foregoing procedure.

To Remove Amplifier from Tape Transport

1. Disconnect the head leads.
2. Disconnect the indicator light.
3. Remove the power cord from the holder on the tape transport.
4. Disconnect the motor leads.
5. Remove the three screws holding the amplifier to the tape transport.
6. Lift the amplifier from the tape transport.
7. To reassemble, reverse the foregoing procedure.

MECHANICAL ADJUSTMENTS

Playback head (46) must be aligned with the tape. If it is not, low output, loss of high frequencies, or track overlap may result.

CAUTION: The playback head has been adjusted at

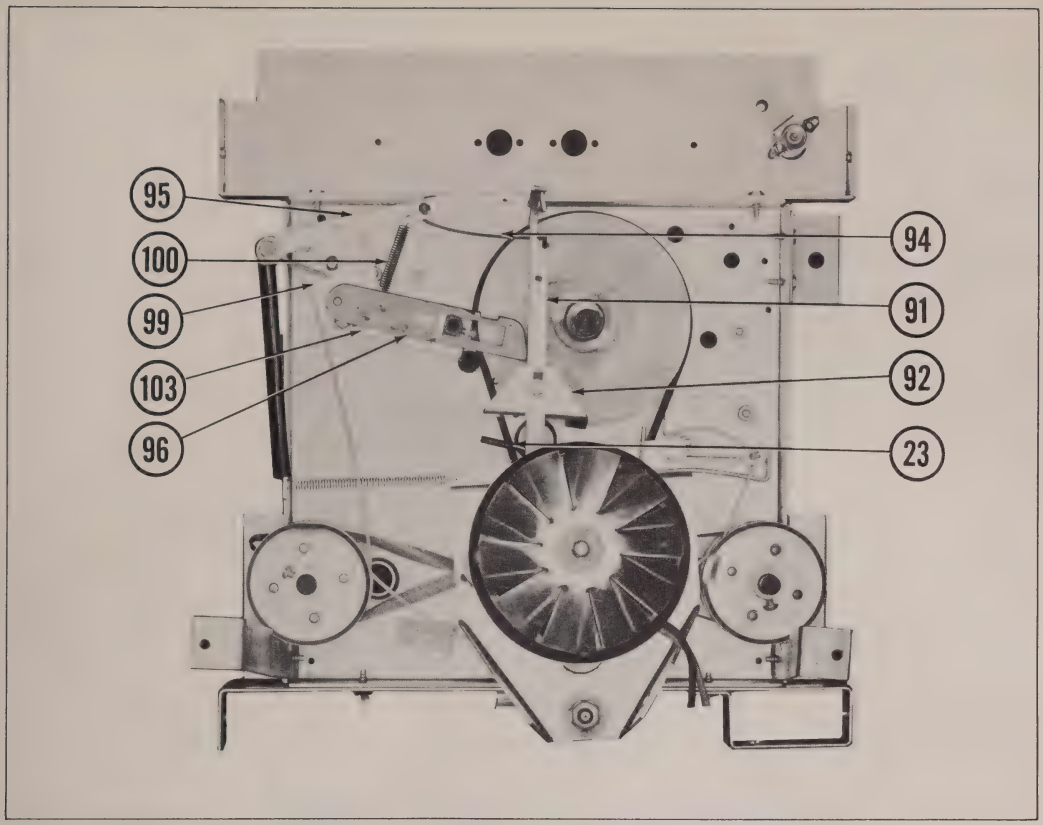


FIG.3 BOTTOM VIEW OF MECHANISM WITH MOTORBOARD SUBPLATE REMOVED

the factory. Further adjustment is unnecessary unless the head becomes faulty and is replaced. Two adjustments should then be made (see the following).

1. Adjust the head height so that the top of the tape is aligned with the top of the head lamination. To adjust, loosen nuts (46A), and slightly raise or lower head (46).

2. Turn head adjustment screw (46B) to the left or right to adjust the head for maximum frequency response. This moves the head from side to side slightly. After completing this adjustment, check the head height.

Brake Release Bracket

Adjust brake release bracket (92) by loosening screw (92A) and moving the bracket forward or backward. When the bracket is moved to the rear of the unit, wind-rewind lever assembly (23) contacts it, giving brake cord (93) more slack. For less slack, reverse the foregoing procedure.

Spindle End Play

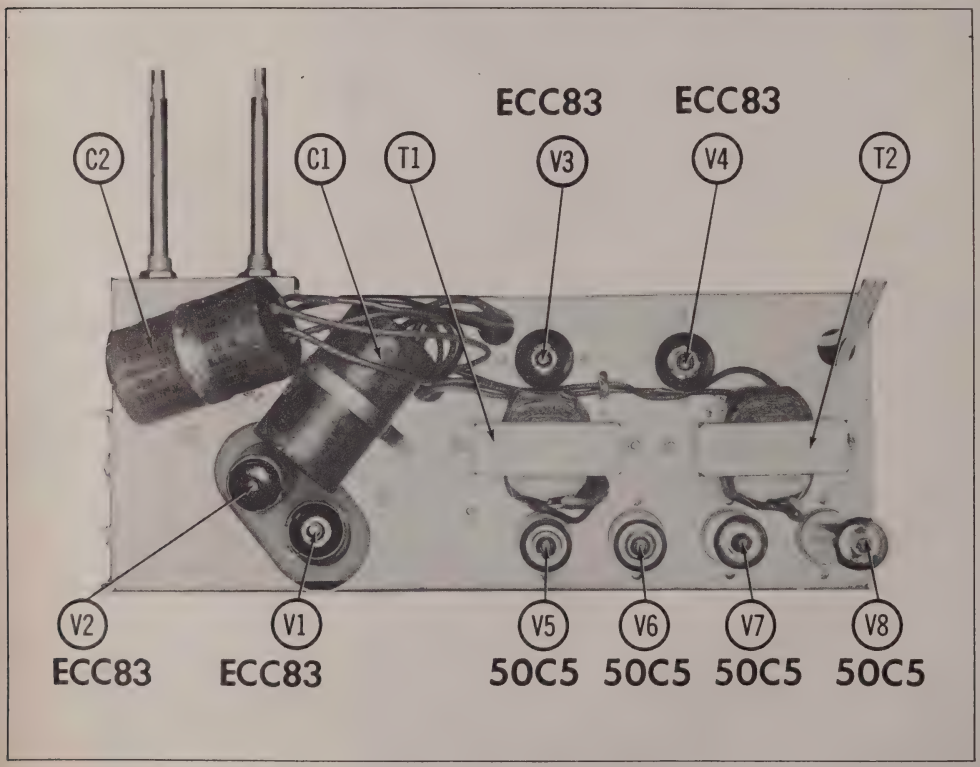
The spindles should have 1/32 to 1/16 inch up and down movement. To obtain the correct amount of end play, loosen set screws (67) in upper pulley (66) and lower pulley (68), and move the pulleys up or down.

TROUBLE CHART

Symptom	Cause	Remedy
No drive in playback.	1. Rubber drive belt (89) loose or broken.	1. Replace drive belt (89).

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	2. Take-up belt (90) loose or broken.	2. Replace take-up belt (90).
	3. Defective motor (81).	3. Replace motor (81).
	4. Connecting leads fouling fan (85).	4. Dress the leads so that they do not touch fan (85).
	5. Flywheel and capstan shaft binding.	5. Clean and lubricate the flywheel and capstan shaft.
	6. Take-up spring (105) disconnected or defective.	6. Reconnect or replace take-up spring (105).
Wow.	1. Dirty or oily capstan sleeve assembly (32), capstan roller (35), or motor pulley (81).	1. Clean with soft cloth and alcohol.
No wind or rewind.	1. Drive belt (89) loose or broken.	1. Replace drive belt (89).
	2. Take-up belt (90) or rewind belt (97) loose or broken.	2. Replace take-up belt (90) or rewind belt (97).
	3. Oil or grease on driving surfaces.	3. Clean with soft cloth and alcohol.
Function control does not operate.	1. Brake spring (98) broken or disconnected.	1. Replace or reconnect brake spring (98).



AMP CHASSIS-TOP VIEW

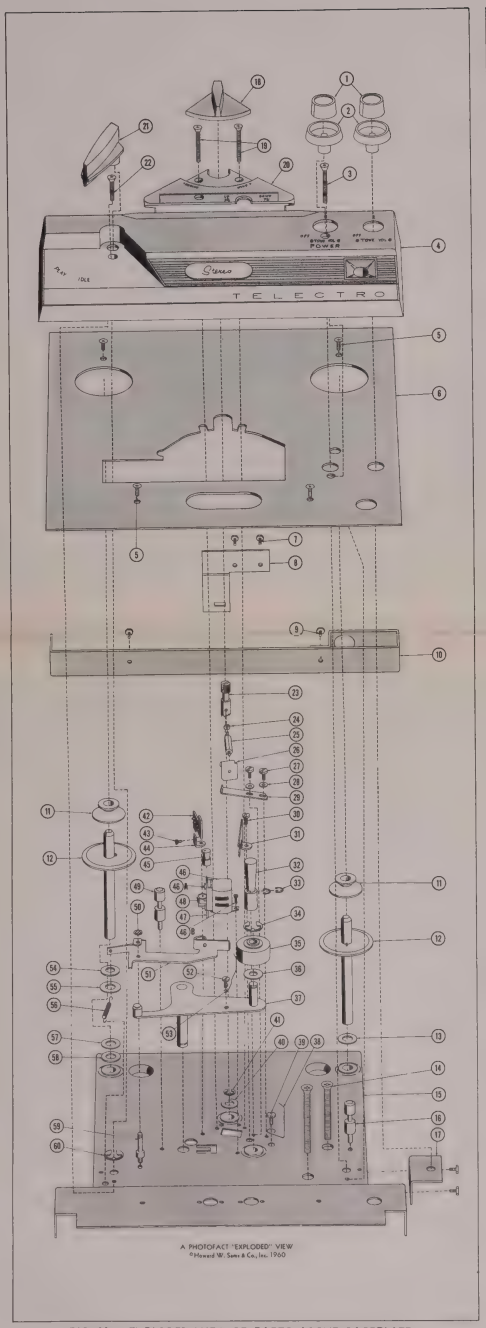


FIG.4A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

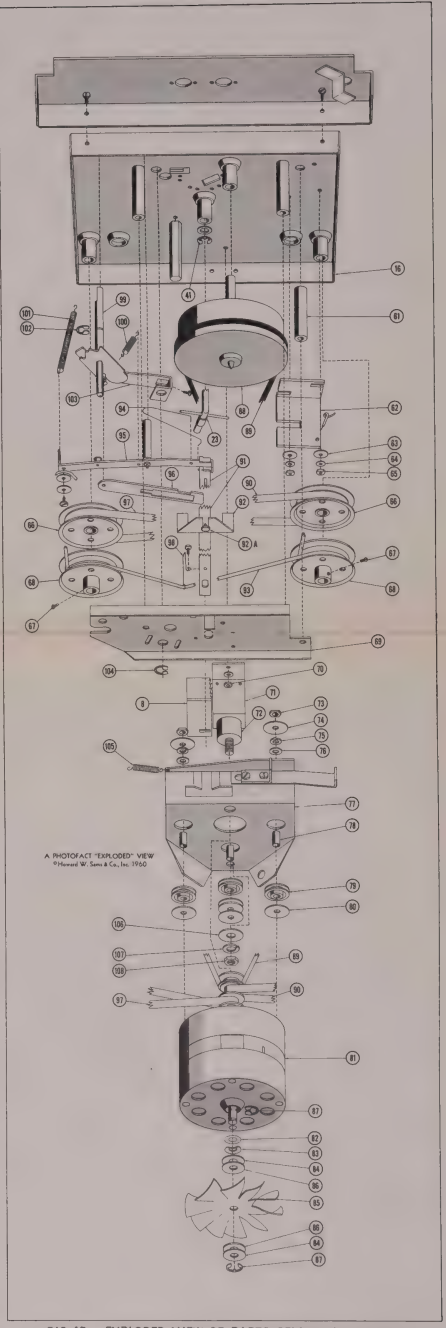
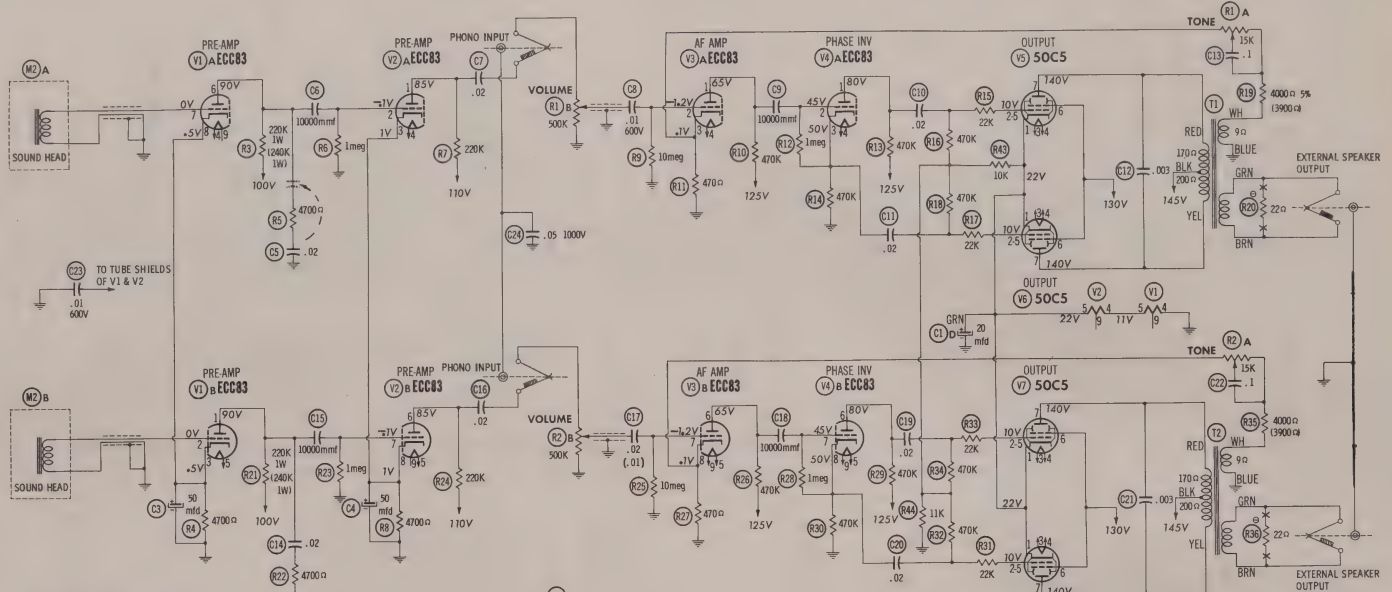


FIG.4B EXPLODED VIEW OF PARTS BELOW BASEPLATE

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	TK255	Volume-On-Off Knob
2	TK254	Tone Control Knob
3		6-32 x 1 1/8 Fl. Phil. Hd. M. Screw
4	TA1437	Front Escutcheon Ass'y.
5		6-32 x 5/16 Lg. Truss Phil. Hd. M. Screw
6	TP1098	Motorboard Dress Plate
7		1/4 Hex Hd. Self-tapping Screw
8	TB2009	Brake Rod Guide Bracket
9		1/4 Hex. Hd. Self-tapping Screw
10		Motorboard Mounting Bracket
11		Reel Retainer
12	TA1105	Spindle
13		.315 I.D. x 9/16 O.D. x .010 Washer
14		Motorboard Subplate and Amplifier Mounting screws (3)
15	TT712	Tape Guide Post
16		Baseplate
17		Bracket-Part of Baseplate
18	TK243	Wind-Rewind Knob
19		6-32 x 1 1/8 Fl. Phil. Hd. M. Screw (2)
20	TE277	Rear Escutcheon
21	TA1439	Function Knob
22		6-32 x 3/4 Fl. Phil. Hd. M. Scr.
23	TA1121	Wind-Rewind Lever Ass'y.
24		6-32 Hex Nut
25	TP983	Hex Shaft
26	TL344	Wind-Rewind Latch
27		6-32 x 3/16 Screw
28		Lockwasher No. 6
29	TS1854	Spring
30		Tape Guide Bracket Screw
31	TB2007	Tape Guide Bracket
32	TA1204	Capstan Sleeve Ass'y.
33		Capstan Sleeve Ass'y. Retaining Rings (2)
34	5133-25	Pressure Roller Retaining Ring
35	TA1002	Pressure Roller
36		Pressure Roller Washer .255 I.D. x 1/2 O.D. x .010
37	TA1186	Capstan Roller Plate Ass'y.
38	TG414	Tape Guide, Upright
39		#6 x 1/4 Lg. Hex Slotted Sht. Met. Type Z.
40		.255 I.D. x 1/2 O.D. x .010 Flat Washer
41	5103-25	Wind-Rewind Lever Retaining Ring
42	TB2001	Head Lead Terminal Board
43		Head Lead Terminal-Board Screw
44	TB2006	Terminal-Board Bracket
45	TK256	Head-Elevation Knob
46	TH557	1/4 Track Head
46A		#2 Hex Nut
46B		Head Adjustment Screw
47	TB2028	Head Mounting Bracket
48	TP1150	Head Lifting Sliding Plate
49	TT712	Tape-Guide Post
50	5133-12	Pressure-Pad Bracket Ass'y. Retaining Ring
51	TA1125	Pressure-Pad Bracket Ass'y.
52		Tape-Release Guide Mtg. Screw, 440 x 3/16 Phil.
53	TG419	Tape-Release Guide
54		.315 I.D. x 1/2 O.D. x .032 Thk. Fiber Washer
55		.315 I.D. x 9/16 O.D. x .010 Flat Steel Washer
56	TS1931	Pressure-Pad Spring
57		.315 I.D. x 1/2 O.D. x .032 Fiber Washer
58		.315 I.D. x 9/16 O.D. x .010 Flat Steel Washer
59		Pressure-Pad Bracket Ass'y. Mtg. Stud
60		Switch Shaft & Cam Ass'y. Retaining Ring
61	TS2029	Motorboard Subplate Spacer
62	TB619	Bracket Excursion Limit
63		Flat Washer
64		Flat Washer
65		Hex Nut
66	TA265	Upper Pulley
67		Set Screw
68	TA1183	Lower Pulley
69	TA1205	Motorboard Subplate
70		Hex Nut
71		Motor Pivot Mtg. Bracket
72		Motor Pivot
73		Hex Nut
74		Flat Washer
75		Lockwasher
76		Flat Washer
77	TB2003	Motor Mtg. Bracket
78		Motor Mtg. Sleeve
79	TM415	Rubber Motor Shock Mount
80		Flat Washer
81	TA1438	Motor & Pulley Ass'y.
82		Retaining Ring
83		Flat Washer
84		Fiber Washer (2)
85	TF258	Fan
86		Felt Washer (2)
87		Fan Retaining Ring
88	TF304	Flywheel Ass'y.
89	TO171	Linear "O" Ring Drive Belt
90	TB998	Take-up Belt
91	TA1128	Brake Rod Subassembly
92	TB858	Brake Release Bracket
92A		#6 x 1/4 Self-tapping Screw
93	TB1004	Brake Cord (25" Long)
94	TS1657	Brake-Rod Return Spring
95	TA1004	Switch Detent Lever Ass'y.
96	TS1625	Interlock Slide
97 *	TB999 *	* Rewind Belt
98	TS1658	Brake Spring
99	TA1209	Switch Shaft & Cam Ass'y.
100	TS1681	Capstan-Roller Plate Lever Spring
101	TS1905	Switch-Detent Lever Spring
102		Switch Shaft & Cam Ass'y. Retaining Ring
103	TA1122	Capstan-Roller Plate Cam Lever Ass'y.
104		Capstan-Roller Plate Ass'y. Retaining Ring
105	TS2022	Take-up Spring
106		Flat Washer
107		Lockwasher
108		Hex Nut

* Rewind Belt Walsco Part No. 1409-04



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†340K	*	4700Ω	0Ω	12Ω	†340K	*	4700Ω	6Ω
V2	ECC83 12AX7	†270K	1meg	4700Ω	12Ω	24Ω	†270K	1meg	4700Ω	18Ω
V3	ECC83 12AX7	†470K	10meg	470Ω	0Ω	0Ω	†470K	10meg	470Ω	6Ω
V4	ECC83 12AX7	†470K	1.5meg	470K	12Ω	12Ω	†470K	1.5meg	470K	6Ω
V5	50C5	24Ω	500K	12Ω	62Ω	500K	†1000Ω	170Ω		
V6	50C5	24Ω	500K	62Ω	85Ω	500K	†1000Ω	†200Ω		
V7	50C5	24Ω	500K	12Ω	62Ω	500K	†1000Ω	†170Ω		
V8	50C5	24Ω	500K	62Ω	85Ω	500K	†1000Ω	†200Ω		

* DO NOT MEASURE WITH HEAD CONNECTED.
† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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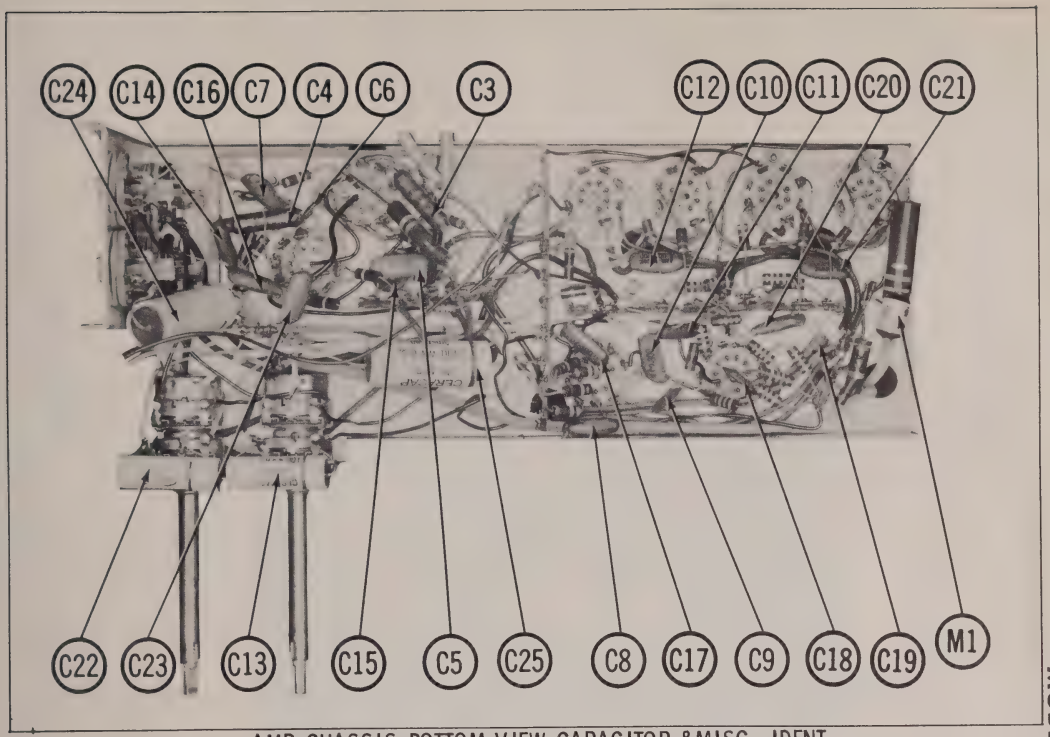
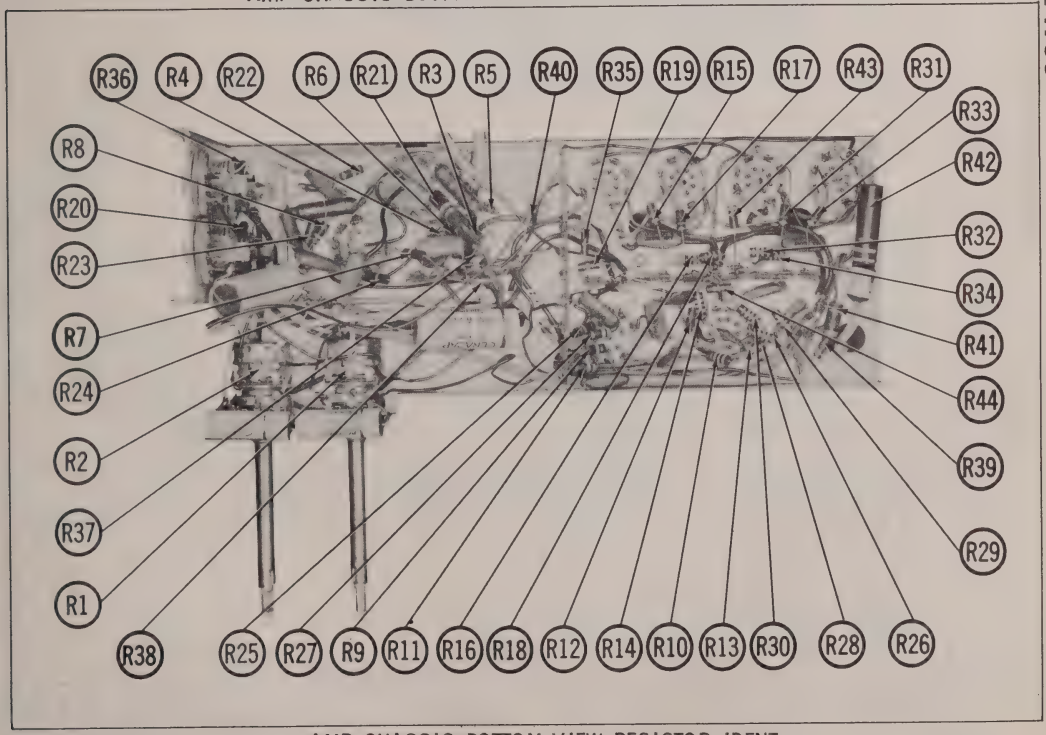
TELECTRO MODEL 1980



AMP CHASSIS BOTTOM VIEW-CAPACITOR &MISC. IDENT.



AMP CHASSIS BOTTOM VIEW-RESISTOR IDENT.

AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Preamplifier - Channel B Preamplifier	ECC83/12AX7	V4	Channel A Phase Inv. - Channel B Phase Inv.	ECC83/12AX7
V2	Channel A Preamplifier - Channel B Preamplifier	ECC83/12AX7	V5	Channel A Output	50C5
V3	Channel A AF Amplifier - Channel B AF Amplifier	ECC83/12AX7	V6	Channel A Output	50C5
			V7	Channel B Output	50C5
			V8	Channel B Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TELECTRO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	TC-1192	PRS3800	BBRT44215	WQ795	TDLT-4	TVA-3448	
B	40	150			BR3015		TD-30-150	TVA-1413	
C	30	150							
D	20	150							
C2A	40	150	TC-1192	PRS3675	BBRT44215	WT217	TDLT-4	TVA-3448	
B	40	150			BR3015	TC47	TD-30-150	TVA-1413	
C	30	150							
D	20	150							
C3	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C4	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.02	300V	Note 1	P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C6	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C8	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C9	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP210	5HK-S10
C10	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C11	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C12	.003	300V		P488N-003	DD-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C13	.1	100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C14	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C15	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C16	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C17	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C18	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	.02	300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C20	.02	300V		P488N-02	DD-203	CUB6S2	4DP-2-203	GEM-412	4TM-S2
C21	.003	300V		P488N-003	DD-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C22	.1	100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C23	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C24	.05	1000V		P1088N-05	DD-503	CUB10S5	16DP-5-503	GEM-1015	10TM-S5
C25	.05	1000V		P1088N-05	DD-503	CUB10S5	16DP-5-503	GEM-1015	10TM-S5

Note 1. Some versions may use .01mfd in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TELECTRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	15K		TC-1694	F1-27		† QJ-1205R	■ UE3905-S	Tone, Channel A
B	500K			R2-41				Volume, Channel A
C	Switch			KR-1				Power Off-On
R2A	15K		TC-1694	F1-27				Tone, Channel B
B	500K			R2-41			■ UE3905-S	Volume, Channel B
C	Switch			KR-1				(Not used)

† "Concentrikit" Equivalent: K-6 kit with base elements and shafts: B11-118, P13-217 (Panel)
(Not available as a factory assembled unit) B13-133, R1-300 (Rear)
76-1 (Switch)

■ "STA-LOC" Equivalent: FA153L, RU55A, OS-2562, IS3000, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	220K 1W	(240K 1W) *
R4	4700Ω	
R5	4700Ω	
R6	1meg	
R7	220K	
R8	4700Ω	
R9	10meg	
R10	470K	
R11	470Ω	
R12	1meg	
R13	470K	
R14	470K	
R15	22K	
R16	470K	

ITEM No.	RATING	REMARKS
R17	22K	
R18	470K	
R19	4000Ω 5%	(3900Ω) *
R20	22Ω	
R21	220K 1W	(240K 1W) *
R22	4700Ω	
R23	1meg	
R24	220K	
R25	10meg	
R26	470K	
R27	470Ω	
R28	1meg	
R29	470K	
R30	470K	

ITEM No.	RATING	REMARKS
R31	22K	
R32	470K	
R33	22K	
R34	470K	
R35	4000Ω	(3900Ω) *
R36	22Ω	
R37	68K	
R38	47K	
R39	1000Ω	
R40	220K	
R41	1000Ω 1W	
R42	6.8Ω 2W	
R43	10K	
R44	11K	

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TELECTRO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4500Ω CT	3-4Ω	TT-674B *							* Alternate Part #TT-674
		SEC.2								
		45Ω								
		SEC.1								
T2	4500Ω CT	3-4Ω	TT-674B *							
		SEC.2								
		45Ω								

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA TELECTRO PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.140A	TD-315 *	SD-500 *	HA154 *	K200 *	SR200 *	* Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	TELECTRO PART No.	NOTES
M2	Head	TH-557	Play (Part of Transport)
M3	Motor	TA-1438	Drive (Part of Transport)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	TK-255	Volume
Knob	TK-254	Tone
Knob	TK-256	Head Elevation

WIRING DATA

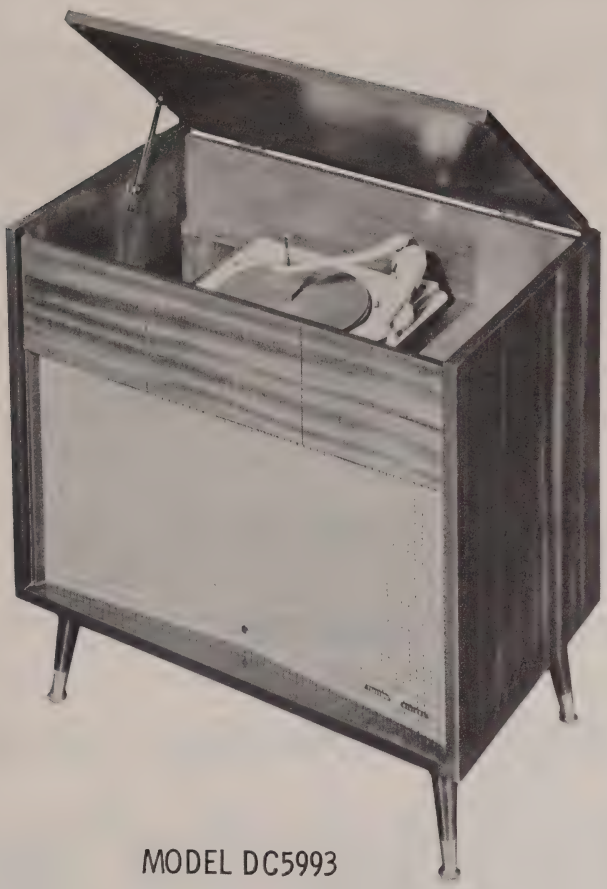
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

**TRUETONE MODELS
DC5993, DC5995**

TRUETONE MODELS
DC5993, DC5995



MODEL DC5993

TRUETONE MODELS
DC5993, DC5995

TRADE NAME	Truetone Models DC5993, DC5995		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Missouri		
TYPE SET	AC Operated FM-AM Receiver, Auxiliary Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	120 Watts, 1.27 Amp. @ 117 Volts AC (AM, with Amplifier)
TUNING RANGES	540 - 1620KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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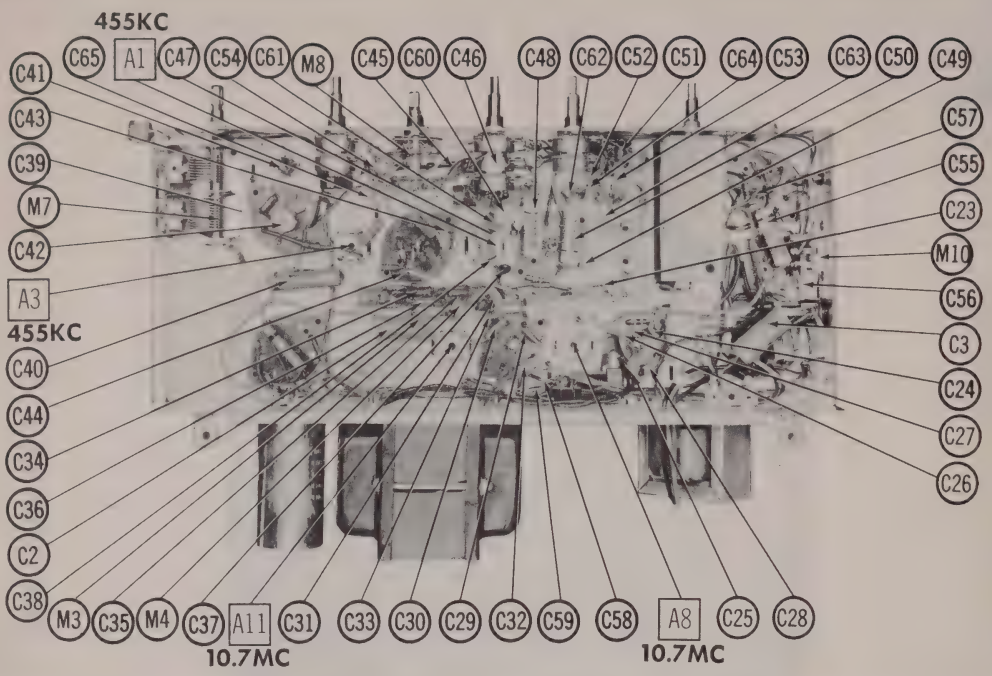
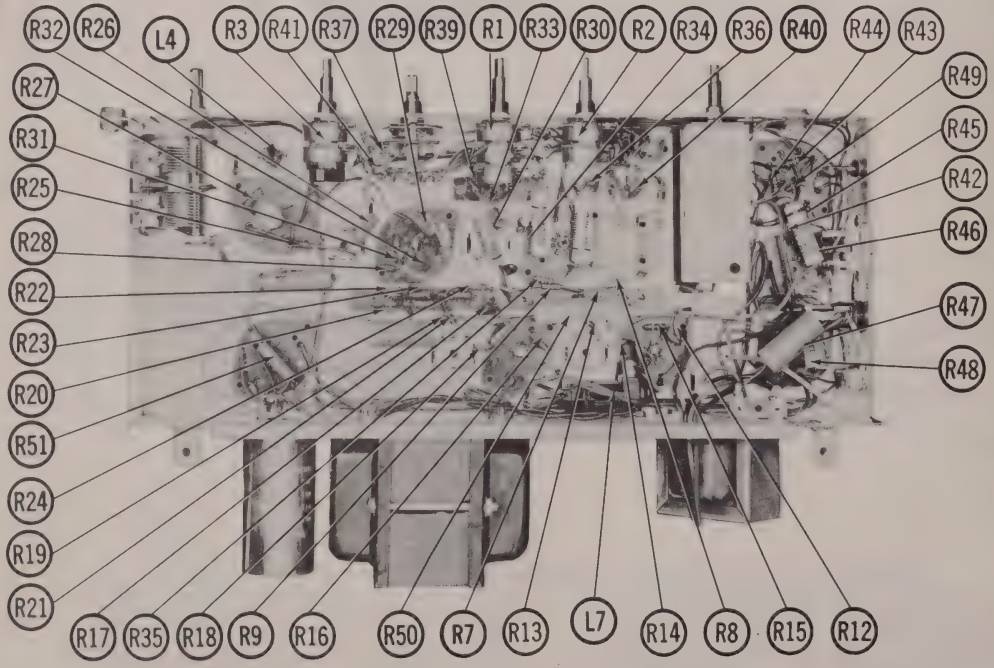
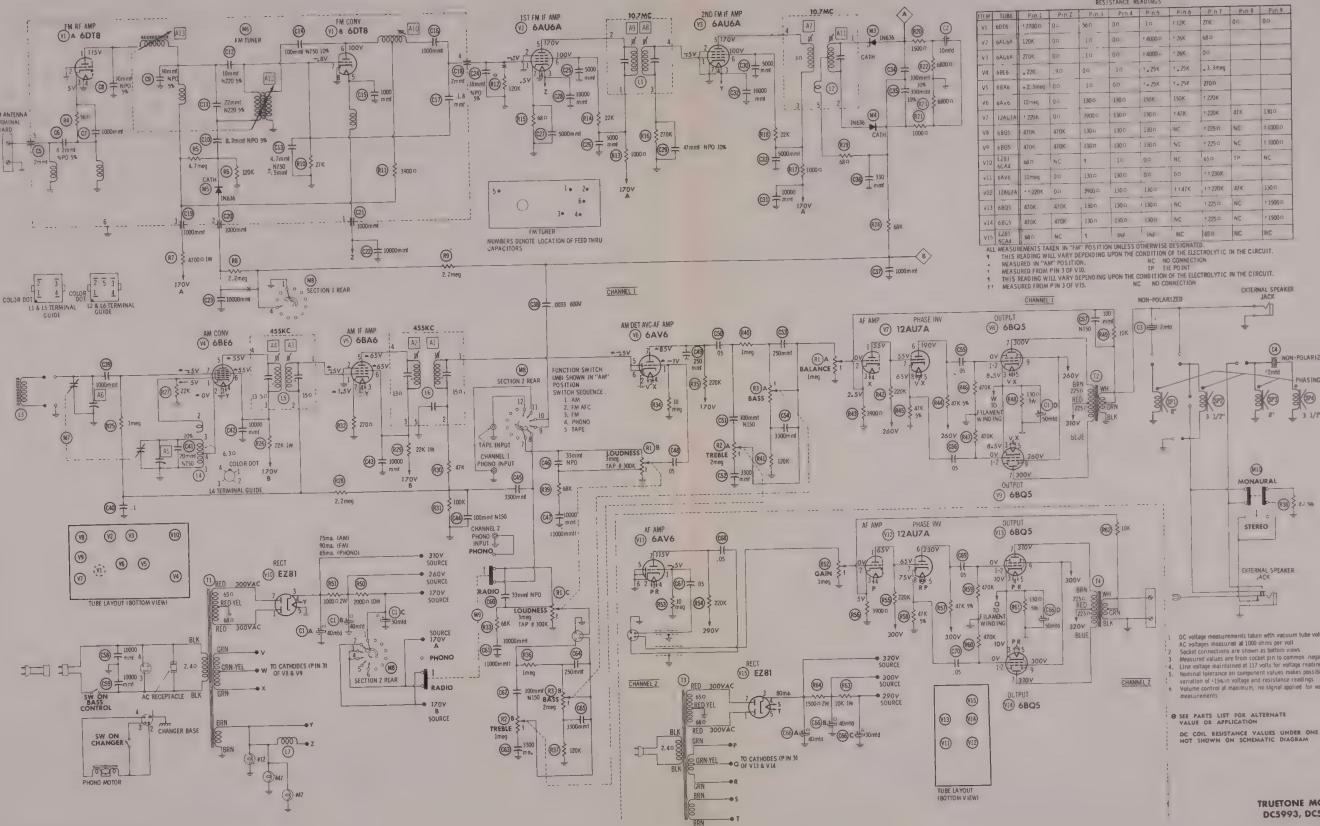


TUNER CHASSIS BOTTOM VIEW — ALIGNMENT, CAPACITOR & MISC. IDENT.



TUNER CHASSIS BOTTOM VIEW — RESISTOR & INDUCTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DT8	*270Ω	0Ω	56Ω	0Ω	1Ω	*12K	27K	0Ω	0Ω
V2	6AL6A	120K	0Ω	1Ω	0Ω	*400Ω	*26K	68Ω		
V3	6AL6A	270K	0Ω	1Ω	0Ω	*400Ω	*26K	0Ω		
V4	6BE6	*22K	1Ω	0Ω	1Ω	*.25K	*.25K	*1.3meg		
V5	6BA6	*2.2meg	0Ω	1Ω	0Ω	*.25K	*.25K	270Ω		
V6	6AV6	10meg	0Ω	130Ω	130Ω	150K	150K	*.25K		
V7	12AU7A	*.22K	0Ω	390Ω	130Ω	130Ω	*47K	*.22K	47K	130Ω
V8	6BQ5	470K	470K	130Ω	130Ω	130Ω	NC	*.22K Ω	NC	*1000Ω
V9	6BQ5	470K	470K	130Ω	130Ω	130Ω	NC	*.22K Ω	NC	*1000Ω
V10	EZ81 SCAP	68Ω	NC	1	1Ω	0Ω	NC	65Ω	1Ω	NC
V11	6AV6	10meg	0Ω	130Ω	130Ω	0Ω	0Ω	*1.22K		
V12	12AU7A	*1.22K	0Ω	390Ω	130Ω	130Ω	1147K	*1.22K	47K	130Ω
V13	6BQ5	470K	470K	130Ω	130Ω	130Ω	NC	*.22K Ω	NC	*1000Ω
V14	6BQ5	470K	470K	130Ω	130Ω	130Ω	NC	*.22K Ω	NC	*1000Ω
V15	EZ81 SCAP	68Ω	NC	1	1Ω	1Ω	NC	65Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC NO CONNECTION
MEASURED IN "AM" POSITION. TP TIE POINT
MEASURED FROM PIN 3 OF V10.
‡ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 3 OF V15. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

TRUETONE MODELS DC5993, DC5995

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A7 thru A11 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	"	Tune to 1400KC signal		A6	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru 5000mmf to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	10.7MC (Unmod.)	FM (No AFC)	Point of non-interference	DC probe thru 10K to point (A). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
5.	Across FM antenna terminals with 120Ω in each lead.	100MC	"	Tune to 100MC signal	"	A10	"
6.	High side thru 5000mmf to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	10.7MC	"	Point of non-interference	DC probe to point (B). Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru 5000mmf to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	10.7MC (450KC Swp)	FM (No AFC)	Point of non-interference	Vert. Amp. thru 10K to point (A). Low side to chassis.	A7, A8, A9	Disconnect Stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1.
5.	Across FM antenna terminals with 120Ω in each lead.	100MC	"	Tune to 100MC signal	"	A10	Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
6.	High side thru 5000mmf to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	10.7MC	"	Point of non-interference	High side to point (B). Low side to chassis.	A11	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	100MC (Unmod.)	FM (No AFC)	100MC	DC probe to point (A). Common to chassis.	A12, A13	Adjust for maximum deflection.

FIG. 1

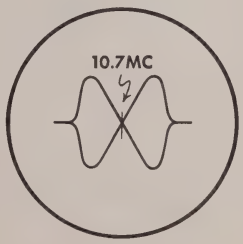
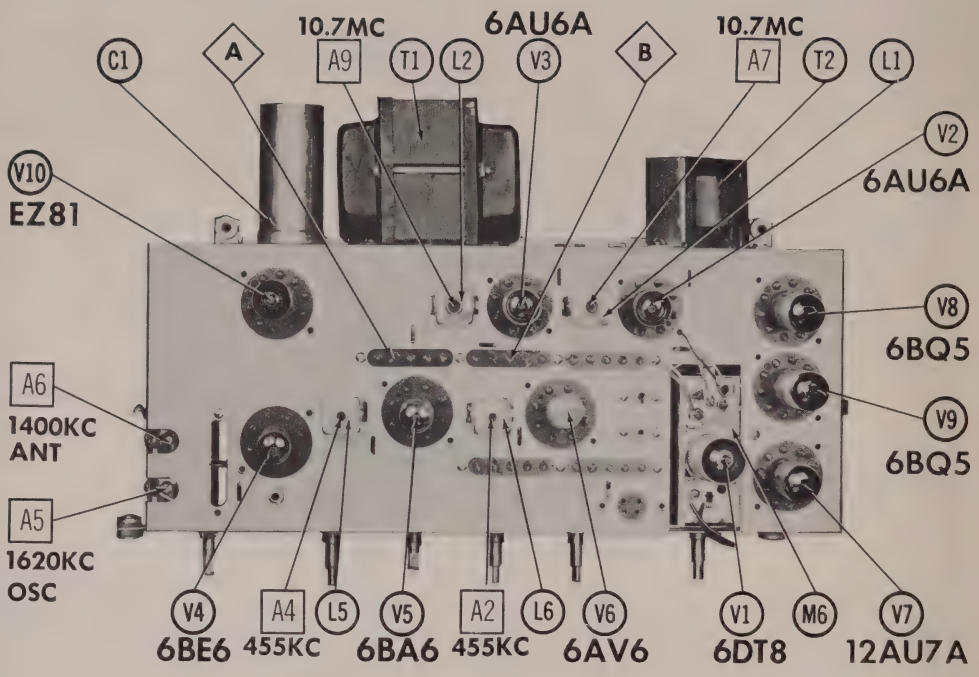
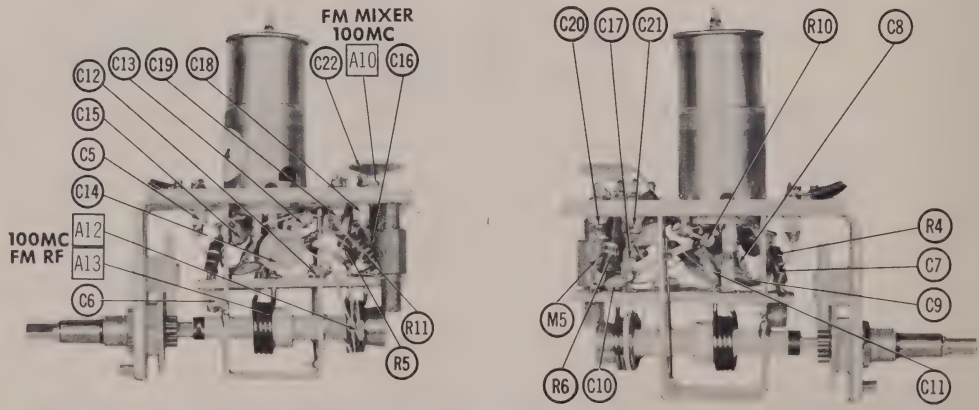


FIG. 2



TUNER CHASSIS — TOP VIEW



FM RF TUNER UNIT

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA TYPE
V1	FM RF Amp. - FM Conv.	6DT8
V2	1st FM IF Amplifier	6AU6A
V3	2nd FM IF Amplifier	6AU6A
V4	AM Converter	6BE6
V5	AM IF Amplifier	6BA6
V6	AM Det. - AVC - Channel 1 AF Amp.	6AV6
V7	Channel 1 AF Amp. - Phase Inverter	12AU7A
V8	Channel 1 Output	6BQ5 (EL84) *
V9	Channel 1 Output	6BQ5 (EL84) *
V10	Rectifier	EZ81/6CA4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	1032	AFH4-93	C0350	FP431.3	TMQ-60	TVL-4622	
B	■40	350			BR505	TC65		TVA-1308	
C	▲30	350							
D	50	50							
C2	10	25	916	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	
C3	2	50NP	830A	NP-PRS7400	BBR4-150 †	TCN502		TVAS-1301.1 *	
C4	2	50NP	830A	NP-PRS7400	BBR4-150 †	TCN502		TVAS-1301.1 *	

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	2							
C6	8.2 NPO 5%		NPO-DI 8.2		C10V82C			10TCC-V82
C7	1000		BPD-001	DD-102	BYA10Di	CCD-102	GP210	5HK-D10
C8	30 NPO 5%			TCZ-30	C10Q30C			10TCC-Q30
C9	30 NPO 5%			TCZ-30	C10Q30C			10TCC-Q30
C10	8.2 NPO 5%		NPO-DI 8.2		C10V82C			10TCC-V82
C11	22 N220 5%					*		10TCR-Q22
C12	10 N220 5%					*		10TCR-Q10
C13	4.7 N750 .5mmf			DTN-5	C10V47U	*	CN7-547	10TCU-V50
C14	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C15	1000		BPD-001	DD-102	BYA10Di	CCD-102	GP210	5HK-DI
C16	1000		BPD-001	DD-102	BYA10Di	CCD-102	GP210	5HK-DI
C17	1.8				C10V2C			
C18	2							
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	
C20	1000		EF-001	MFT-1000		CCF-102	CT280A	
C21	1000		EF-001	MFT-1000		CCF-102	CT280A	
C22	10000		EF-001	MFT-1000		CCF-102	CT280A	
C23	10000		BPD-01	DD-102	BYA10Si	CCD-103	GP110	5HK-S10
C24	18 NPO 5%			TCZ-18	C10Q18C		CNO-418	10TCC-Q18
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C27	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C28	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C29	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C31	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C32	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C33	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C34	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C35	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C36	330		SI 330	D6-331	L10T33	CCD-331	GP333	10TS-T33
C37	1000		BPD-001	DD-102	BYA10Di	CCD-102	GP210	5HK-D10
C38	.0033 600V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C39	1000		BPD-001	DD-102	BYA10Di	CCD-102	GP210	5HK-D10
C40	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C41	20 N750 10%		N750-DI 20	DTN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C42	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C43	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C44	100 N150	#826				*		10TCP-T10
C45	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C46	33 NPO		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C47	10000	(1000mmf) †	BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C48	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C49	250		DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C50	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C51	100 N150	#826				*		10TCP-T10
C52	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C53	250		DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C54	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C55	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C56	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C57	100 N150	#826				*		10TCP-T10
C58	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C59	10000		BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C60	33 NPO		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C61	10000	(1000mmf) †	BPD-01	DD-103	BYA10Si	CCD-103	GP110	5HK-S10
C62	100 N150	#826				*		10TCP-T10
C63	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C64	250		DI-250	DD-250	L10T25	CCD-251	GP325	10TS-T25
C65	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33

\# Truetone Part Number. † Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	428					Balance
B	3meg 300K Tap	½						Loudness, Channel 2
C	3meg 300K Tap	½						Loudness, Channel 1
R2A	1meg	½	430	F1-54		† QJ-1135R	■ UE4077	Treble, Channel 2
B	1meg	½		R2-54				Treble, Channel 1
R3A	2meg	½	429				▪	Bass, Channel 2
B	2meg	½						Bass, Channel 1
C	Switch							Push Pull Off-On

† "Concentrikit" Equivalent: K-2 Kit With Base Elements and Shafts: Bl3-137, P1-028 (Panel)
Not available as a factory assembled unit. Bl3-137, R1-108 (Rear)
■ "STA-LOC" Equivalent: FA16A, RU16A, OF875, IS1250.
▪ "STA-LOC" Equivalent: FA255L, RU255L, OF875.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	56Ω	
R5	4.7meg	
R6	120K	
R7	4700Ω 1W	
R8	2.2meg	
R9	2.2meg	
R10	27K	
R11	3900Ω	
R12	120K	Note 1
R13	1000Ω	
R14	22K	
R15	68Ω	
R16	270K	
R17	1000Ω	
R18	22K	
R19	68Ω	

ITEM No.	RATING	REMARKS
R20	1500Ω	
R21	1000Ω	
R22	6800Ω	
R23	6800Ω	
R24	68K	
R25	1meg	
R26	22K 1W	
R27	22K	
R28	2.2meg	
R29	22K 1W	
R30	47K	
R31	100K	
R32	270Ω	
R33	68K	
R34	10meg	
R35	220K	

ITEM No.	RATING	REMARKS
R36	1meg	
R37	120K	
R38	4Ω 5W	
R39	68K	
R40	1meg	
R41	120K	
R42	220K	
R43	3900Ω	
R44	47K 5%	
R45	47K 5%	
R46	470K	
R47	470K	
R48	130Ω 5W	
R49	10K	
R50	2000Ω 10W	
R51	1000Ω 2W	

Note 1. Not used in some versions.

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	2nd FM IF	1413	16-3487	16-3487	BC-254	1463		
L2	Ratio Detector	1414	17-3498	17-3498	FM-255	1465		
L3	Loopstick	1512E						
L4	AM Osc. Coil	1401A			BC-393			
L5	1st AM IF Trans.	1405	16-6758	16-6758	BC-352	12-C1	RF-1	
L6	2nd AM IF Trans.	1406A	16-6770	16-6770	BC-355	12-C6		
L7	Fil. Choke							

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .72A	600VCT @ .090A	6.3VCT @ 2.1A	1108						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.5A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6400Ω CT	3-4Ω Tap @ 1-2Ω	1212		A-2905①	AU-606	A-3870		S-55X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	8"	PM	4-6Ω	2640	8A31	
SP2	3½"	PM	4-6Ω	2641	4AQ7	
SP3	8"	PM	4-6Ω	2640A	8A31	
SP4	3½"	PM	4-6Ω	2641	4AQ7	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	TRUETONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		13T	Not Req.	66 *	Not Req.			8TA4-S	N-8TA-S

* Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRUETONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		* W-204DS ♦ † or * W-204DD ♦	* A-44X † or * A-44XSD † ♦ or * A-44XDD ♦	† Jewel ♦ Diamond * Includes Cartridge

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N636		1N636	1N636	1N636	Ratio Det. (Pigtail) Matched
M4	1N636		1N636	1N636	1N636	Ratio Det. (Pigtail) Pair
M5	1N636		1N636	1N636	1N636	AGC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M6	Tuner	1023A	FM, Complete
M7	Tuning Cap	1024	AM, 2 Gang (Ant. 28-400mmf, Osc. 15-185mmf)
M8	Switch	420A	Function (Rotary Type)
M9	Switch	1892A	Selector (DPDT, Slide Type)
M10	Switch	1892A	Stereo-Monaural (DPDT, Slide Type)

AMP PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V11	Channel 2 AF Amp.	6AV6	V13	Channel 2 Output	6BQ5 (EL84) *
V12	Channel 2 AF Amp. - Phase Inverter	12AU7A	V14	Channel 2 Output	6BQ5 (EL84) *
			V15	Rectifier	EZ81/6CA4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C66A	■40	350	1032	AFH4-93	C0350	FP431.3	TMQ-60	TVL-4622	
B	▬40	350			BR505	TC65		TVA-1308	
C	▲30	350							
D	50	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C67	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C68	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C69	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C70	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R52A	1meg	½	421	B-69	A47-1meg-S	Q11-137	U54	Gain
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R53	10meg	
R54	220K	
R55	220K	
R56	3900Ω	

ITEM No.	RATING	REMARKS
R57	47K 5%	
R58	47K 5%	
R59	470K	
R60	470K	

ITEM No.	RATING	REMARKS
R61	130Ω 5W	
R62	10K	
R63	10K 1W	
R64	1500Ω 2W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	117V @ .67A	600VCT @ .080A	6.3VCT @ 2.1A	1108						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ .6A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	6400Ω CT	3-4Ω Tap @ 1-2Ω	1212		A-2905①	AU-606	A-3870		S-55X	① Drill new mounting hole.

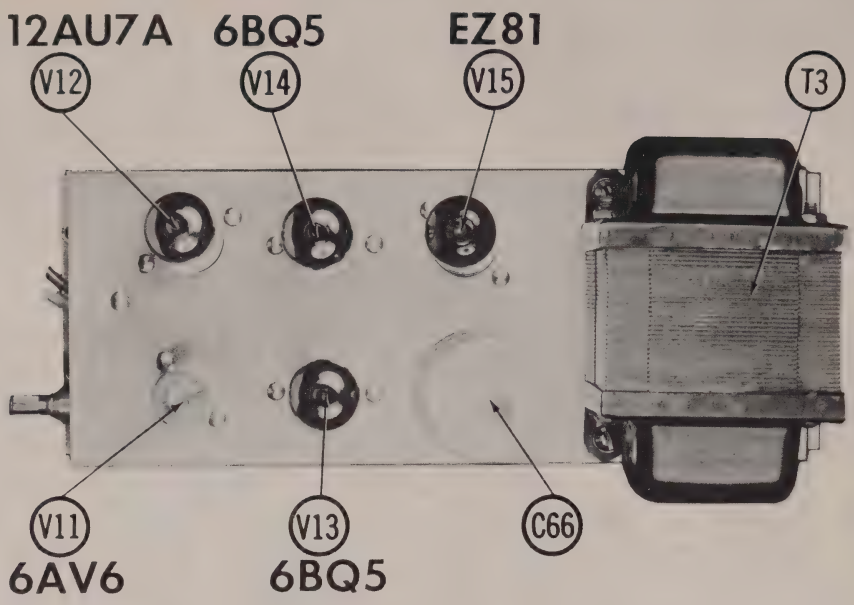
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

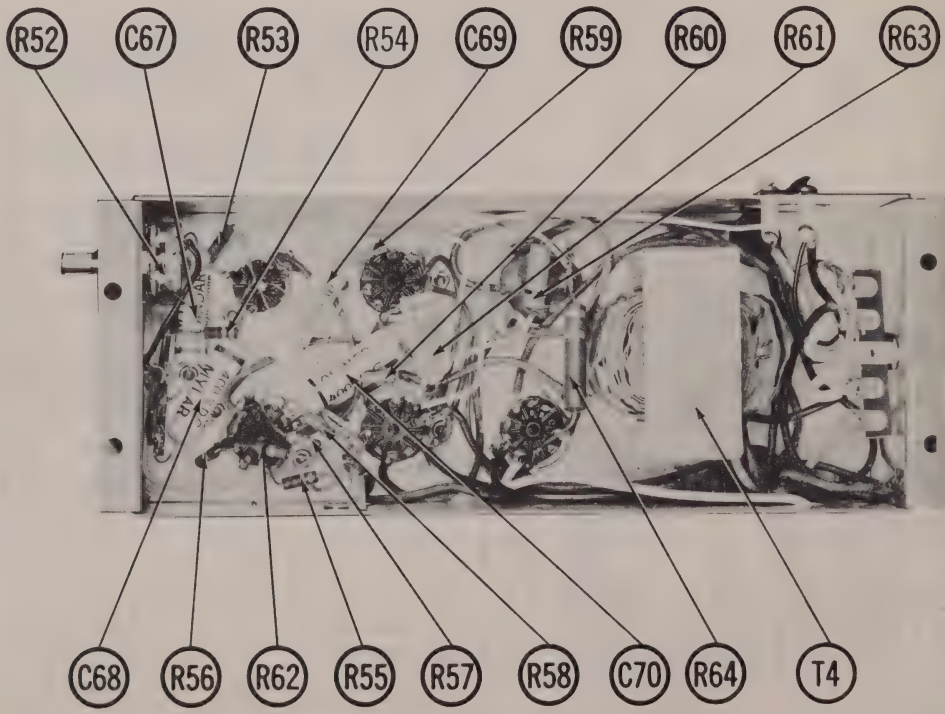
NAME	PART NO.	DESCRIPTION
Knob	2458	FM Tuning
Knob	2457	AM Tuning
Knob	2436	Balance, Loudness, Treble, Function, Bass
Cabinet	3928	(Specify Finish)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



AMP CHASSIS – TOP VIEW



AMP CHASSIS – BOTTOM VIEW

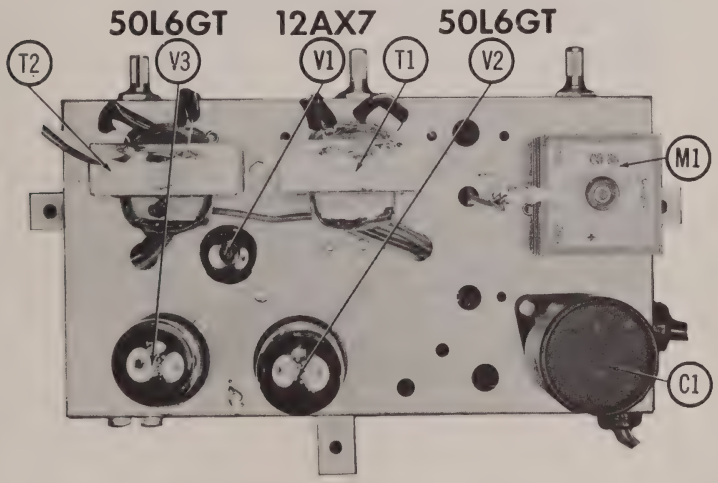
PHOTOFACT® Folder

TRUETONE MODEL 4DC5900

TRUETONE MODEL 4DC5900

TRADE NAME	Truetone Model 4DC5900		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.		
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer		
POWER SUPPLY	110-125 Volts AC, 60 Cycles	RATING	31 Watts, .33 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RC-35 - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11



TRUETONE MODEL 4DC5900

SET 480 FOLDER 17

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JT557

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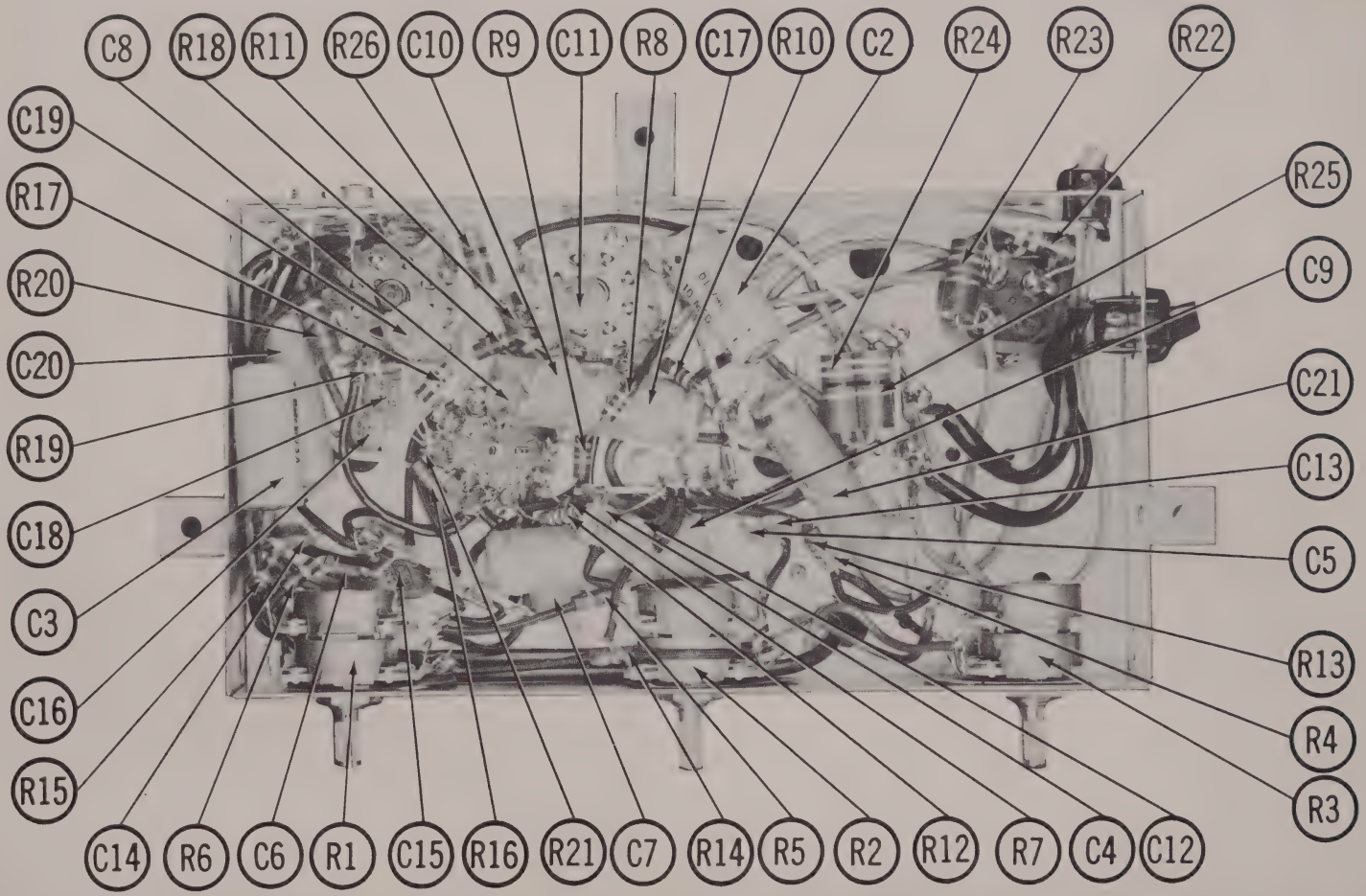


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amplifier	12AX7
V2	Channel 1 Output	50L6GT
V3	Channel 2 Output	50L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	EC-29	AFH3-44	C0350	FP327. 89	TMT-23	TVL-3440	
B	■40	150							
C	▲40	150							
C2	10	70	EC-11	SRE70V10	BBR10-90	TC42	TD-10-150	TVA-1406	
C3	10	70	EC-11	SRE70V10	BBR10-90	TC42	TD-10-150	TVA-1406	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	270	10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C5	680	10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C6	2000	10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C7	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	470	10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C9	.25	200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C10	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	2000	10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C12	270	10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C13	680	10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C14	2000	10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C15	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C16	470	10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C17	.25	200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C18	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	2000	10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C20	.05	600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C21	.05	600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg *		VC-152					Loudness, Channel 1
B	3meg *							Loudness, Channel 2
R2A	250K †		VC-151				■ UE4007	Treble, Channel 1
B	250K †							Treble, Channel 2
R3A	2meg		VC-153	B-75	AD47-2meg-S	Q11-139		Bass, Channel 1
B	2meg			SR-75	Not Req.	M11-139	▲ UE1878	Bass, Channel 2
C	Shaft			Not Req.	KSS-3	Not Req.		

* Taps @ 1meg and 2meg. 2 meg tap not used. † Tap @ 125K.
■ "STA-LOC" Equivalent: FA254T1253, RU254T154, CS3500.
▲ "STA-LOC" Equivalent: FB26L, RU26L, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	47K	
R5	220K	
R6	100K	
R7	2.2meg	
R8	470K	
R9	270Ω	
R10	470K	
R11	220Ω 1W	

ITEM No.	RATING	REMARKS
R12	47K	
R13	47K	
R14	220K	
R15	100K	
R16	2.2meg	
R17	470K	
R18	270Ω	
R19	470K	

ITEM No.	RATING	REMARKS
R20	220Ω 1W	
R21	47K	
R22	10K 1W	
R23	270Ω 2W	
R24	47Ω 2W	Note 1
R25	47Ω 2W	Note 1
R26	22Ω 1W	

Note 1. Some versions may replace R24 and R25 with a single 23Ω resistor.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2000Ω	20Ω SEC. 3	AT-46							
		1-2Ω SEC. 1								
T2	2000Ω	20Ω SEC. 2	AT-46							
		1-2Ω								

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	SPK-36	5A07	
SP2	5"	PM	3-4Ω	SPK-36	5A07	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA TRUETONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.072A	SR-5 ①	T300 ①	1236AH ①	300 ①	SR200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	PU-35	13T	Not Req.	13				8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-204DS † ♦ or W-204DD-1 ♦	A-44X † or A-44XSD † ♦ or A-44XDD ♦	† Jewel ♦ Diamond

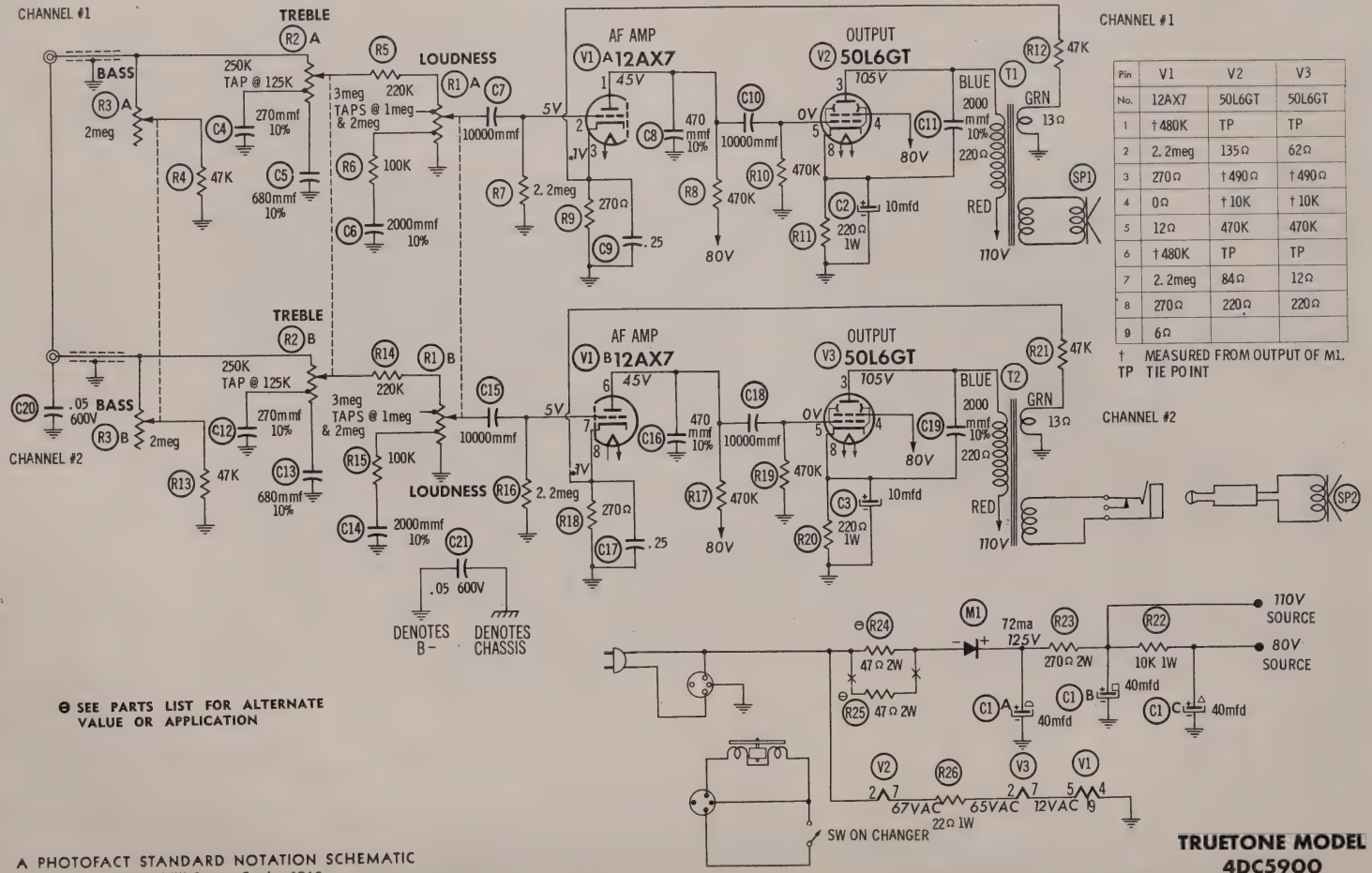
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	K292	Volume, Tone
Cabinet	CA-338	

TRUETONE MODEL 4DC5900

FOLDER 17



Pin	V1	V2	V3
No.	12AX7	50L6GT	50L6GT
1	†480K	TP	TP
2	2.2meg	135Ω	62Ω
3	270Ω	†490Ω	†490Ω
4	0Ω	†10K	†10K
5	12Ω	470K	470K
6	†480K	TP	TP
7	2.2meg	84Ω	12Ω
8	270Ω	220Ω	220Ω
9	6Ω		

† MEASURED FROM OUTPUT OF M1.
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TRUETONE MODEL 4DC5900

PHOTOFACT® Folder with CIRCUITRACE®

WESTINGHOUSE MODELS H-704T5, H-705T5, H-706T5 (Ch. V-2398-1)

WESTINGHOUSE MODELS H-704T5, H-705T5, H-706T5 (Ch. V-2398-1)

MODEL H-704T5

WESTINGHOUSE MODELS H-704T5, H-705T5, H-706T5 (Ch. V-2398-1)

TRADE NAME	Westinghouse Models H-704T5, H-705T5, H-706T5 (Ch. V-2398-1)
MANUFACTURER	Westinghouse Electric Corp., Metuchen, N. J.
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	105-125 Volts AC-DC
RATING	25 Watts, .24 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 — 1625KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control shoulbe be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4..... ... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru 200mmf to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1625KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY

1. Remove 2 screws from top corners of cabinet rear.
2. Remove screw from cabinet bottom.
3. Separate cabinet front from cabinet back.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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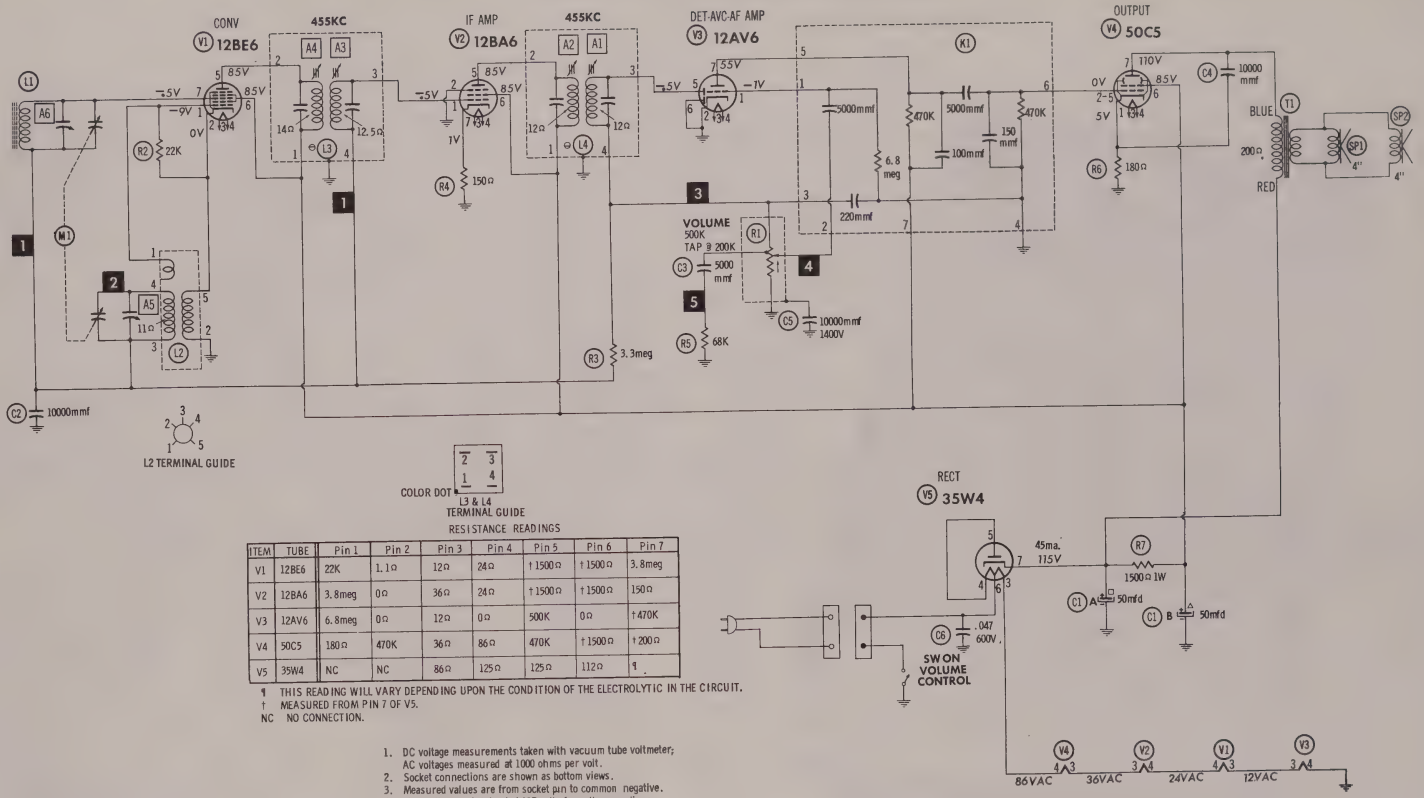
JG768

SET 480 FOLDER 18



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.1Ω	12Ω	24Ω	†1500Ω	†1500Ω	3.8meg
V2	12BA6	3.8meg	0Ω	36Ω	24Ω	†1500Ω	†1500Ω	150Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V4	50C5	180Ω	470K	36Ω	86Ω	470K	†1500Ω	†200Ω
V5	35W4	NC	NC	86Ω	125Ω	125Ω	112Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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WESTINGHOUSE MODELS H-704T5, H-705T5, H-706T5 (Ch. V-2398-1)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Det. -AVC-AF Amp.	12AV6
V4	Output	50C5
V5	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	218V025H07	PWH2-15-05	XB0161 ‡	FP214 ♦	TDLD-9	PCLS-2435.1*	
B	▲50	150							

‡ Use printed circuit adaptor #55277 and 55278.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
♦ Use Adaptor kit FPA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C3	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	10000 1400V		DAC-27	DD16-103	HVD16S1	16DP-3-103	UAC-110	BL-S10
C6	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	270V071H02					Volume
B	200K Tap Switch							Power (Push-Pull)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	22K	
R3	3.3meg	
R4	150Ω	
R5	68K	
R6	180Ω	
R7	1500Ω 1W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Coupling	100mmf, 150mmf, 220mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	219V001H01	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

PRINTED BOARD

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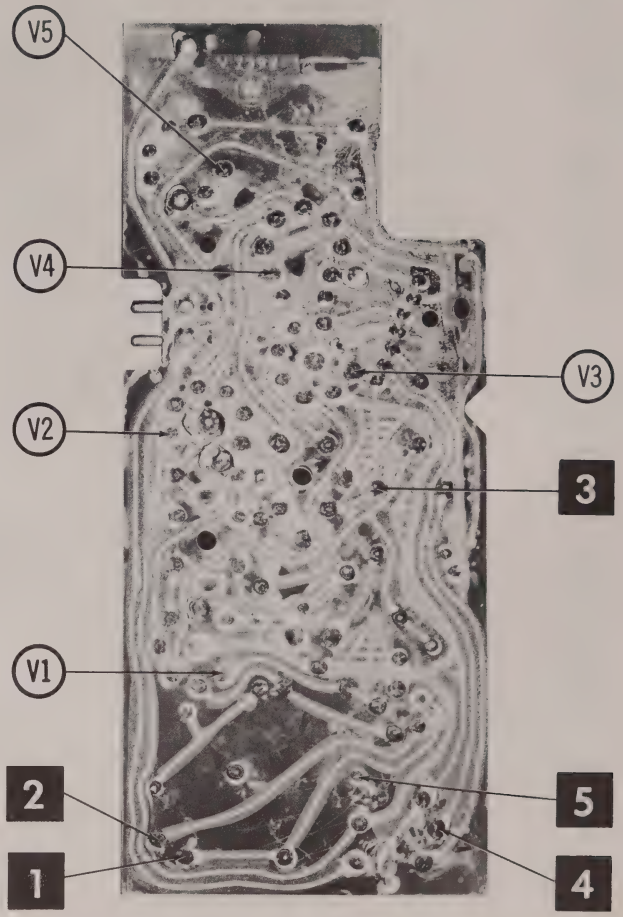
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Westinghouse PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	310V050H01						
L2	Osc. Coil	230V040H05						
L3	Input IF	235V053H01 †	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	235V053H02 †	16-6780	16-6780	BC-357	13-PC2	RF-4	

† Alternate Part #235V023H11

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	430V065H01	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	570V026H03		
SP2	4"	PM	3-4Ω	570V026H03		

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning Cap.	330V029H01	2 Gang (Ant. 13—290mmf, Osc. 10—102mmf)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

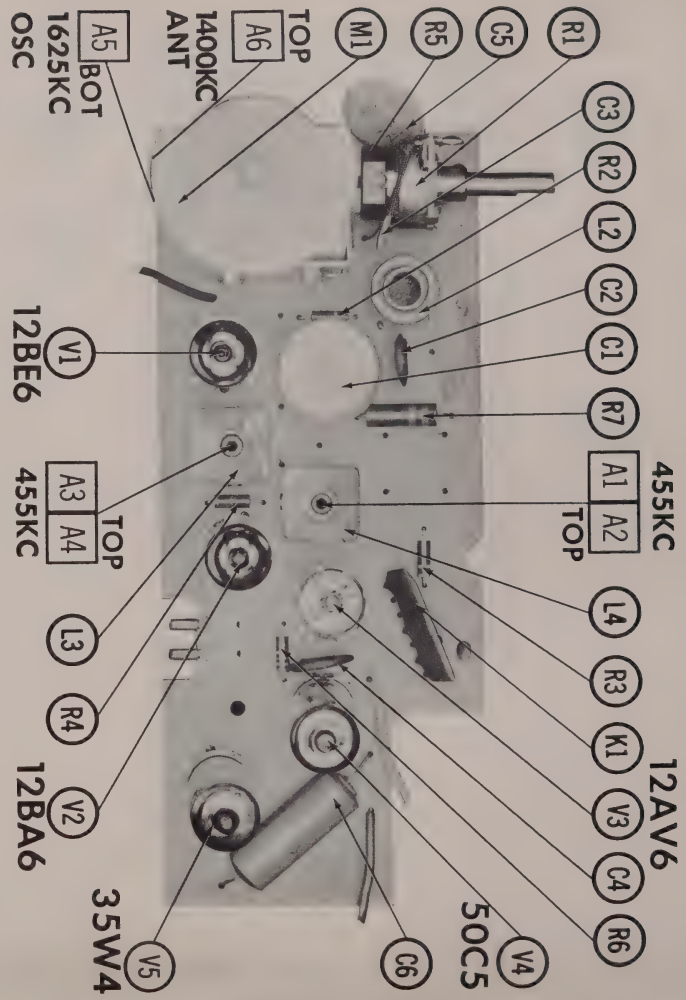
NAME	PART NO.	DESCRIPTION
Knob	550V101H06	Off-On Volume
Cabinet	513V043H01	Model H-704T5
Cabinet	513V043H02	Model H-705T5
Cabinet	513V043H03	Model H-706T5
Cabinet Front	558V236H01	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT® Folder

ZENITH MODELS BPS-89L, LZ, BRS-89L, LZ, DPS-89C, DRS-89C

ZENITH MODELS BPS-89L, LZ, BRS-89L, LZ, DPS-89C, DRS-89C

ZENITH MODELS BPS-89L, LZ, BRS-89L, LZ, DPS-89C, DRS-89C

TRADE NAME	Zenith Models BPS-89L, BPS-89LZ, BRS-89L, BRS-89LZ, DPS-89C, DRS-89C
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 6 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 36 Watts, .33 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER S-14097 OR S-14098 — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT492

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1 V2	Left Channel AF Amp Left Channel Output	6AU6A 6AQ5A	V3	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■30	350	WC13234	AFH3-109	C0830	FP330	TMT-94	TVL-3636	
B	▲20	350							
C	20	25							
C2	4	10VNP	WC12961	PRS7405	BBR8-150 †	TCN504		TVAS-1150*	

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
*Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	470	①	BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C4	10000	(2200mmf) *	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	.033 200V		P288N-033		CUB4S33	4DP-2-333	GEM-4133	4TM-S33
C6	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C7	4700		BPD-0047	DD-472	BYA10D47	CCD-472	B-247	5HK-D47

* Alternate Value ① Not Used In Models BRS-89L, BRS-89LZ.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5meg	½	WC13226	B-88	A47-5meg-Z	Q13-141	U65	Loudness, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	5meg	½	WC13226	B-88	A47-5meg-Z	Q13-141	U65	Bass, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	2meg	½	WC13224①	B-76	A47-2meg-Z	Q13-137	U55	Treble, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4	1500Ω	1(WW)	WC13239		39-1500	112-1580	FL-1.5K	Balance

① Models BRS-89L, LZ use 2 meg treble with switch (Part #WC13225).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	150K	(270K) *
R6	10meg	(1meg) *
R7	270K	
R8	150K	

* Alternate

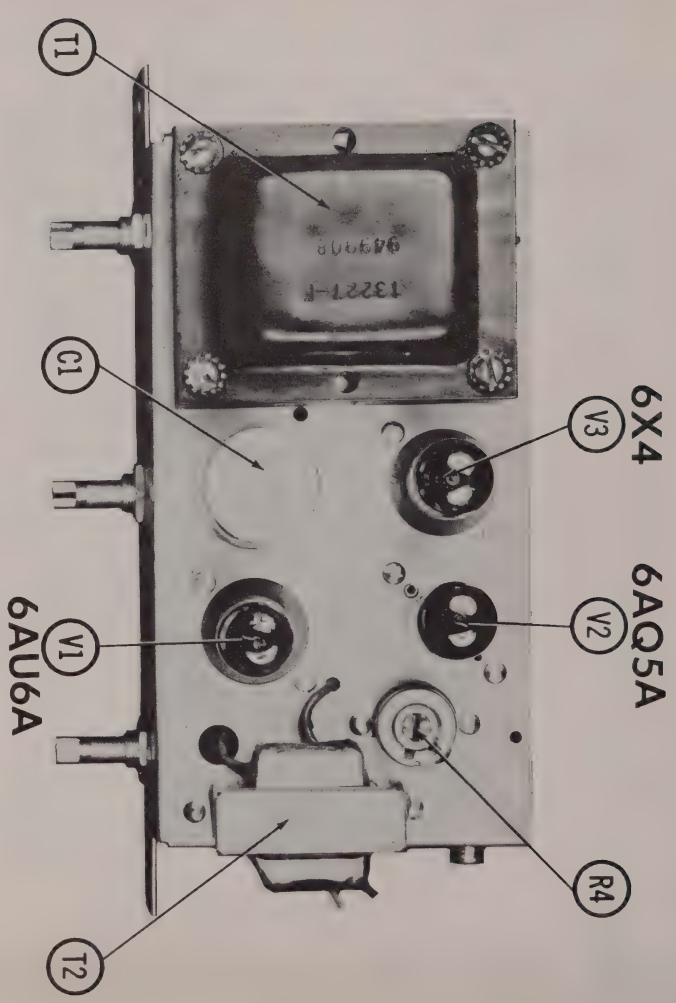
ITEM No.	RATING	REMARKS
R9	27K	
R10	560Ω	
R11	470K	
R12	330Ω 1W	

ITEM No.	RATING	REMARKS
R13	39K	
R14	4700Ω 1W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .33A	510 VCT ⓐ .040A	6.3 VCT ⓐ 1.5A	WC13227	24R09	P-3048		PM8403	24R09	R-8B

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4600Ω	3-4Ω	WC13222	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	WC12963	6A1	
SP2	4"	PM	3-4Ω	WC11792	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	142-99B ① 142-98B ② 142-92 ③	* 13TB	Not Req.	* 26S	Not Req.			* 8TA4-S or * 8TA4-D	N-8TA-S

① Used in Model BPS-89L.
② Alternate Part Number used in Model BPS-89L.
③ Used in Model BPS-89LZ.
* Includes Mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	56-403 † ① 56-406 ♦ ① 56-407 † ②	* W-10ISTS † or * W-102S † or * W-10ISTD ♦	E98 † ③ or E98D ♦ ③ and E98X † ③ or E98XD ♦ ③	† Jewel ♦ Diamond * Includes Cartridge

① For Cartridge 142-99B (Model BPS-89L)
② For Cartridge 142-98B (Model BPS-89L)
③ For Cartridge 142-92 (Model BPS-89LZ)

CABINETS & CABINET PARTS

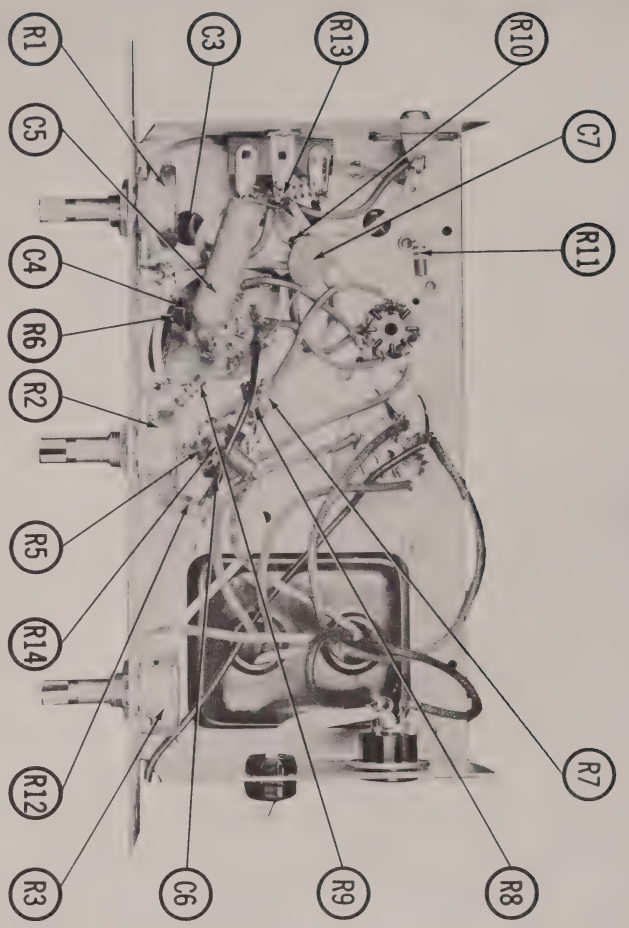
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	WC13132-8EN	Treble, Bass, Loudness
Handle Ass'y.	WC13448-8B	Includes Handle & Plates
Case Ass'y.	WC13290	Includes Hardware & Motor Board, Model BPS-89L, LZ
Case Ass'y.	WC13294	Includes Rear Cover, Hardware & Catch, Model BRS-89L, LZ
Case Ass'y.	WC13693	Includes Rear Cover, Hardware & Catch, Model DPS-89C
Case Ass'y.	WC13694	Includes Rear Cover, Hardware & Catch, Model DRS-89C

WIRING DATA

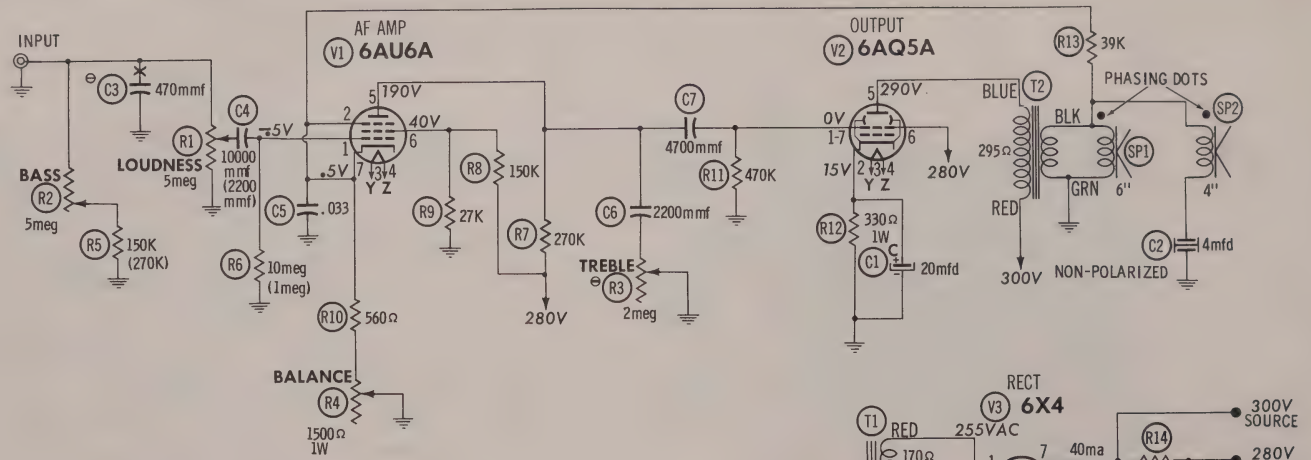
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

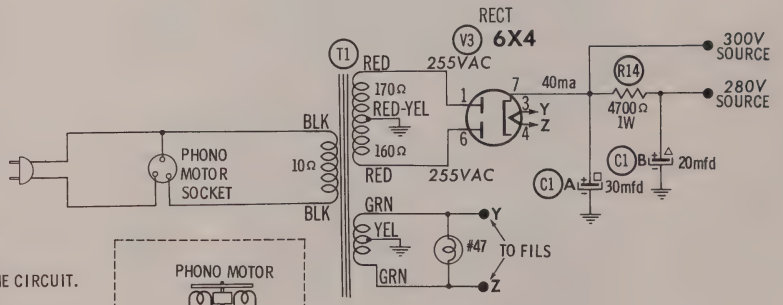
CHASSIS—BOTTOM VIEW

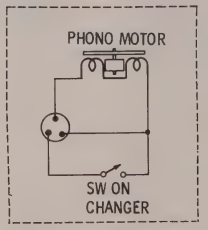


ZENITH MODELS BPS-89L, LZ,
BRS-89L, LZ, DPS-89C, DRS-89C

FOLDER 19







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AU6A	10meg	1200Ω	.1Ω	.1Ω	†275K	†100K	1200Ω
V2	6AQ5A	470K	330Ω	.1Ω	.1Ω	†290Ω	†4700Ω	470K
V3	6X4	170Ω	NC	.1Ω	.1Ω	NC	160Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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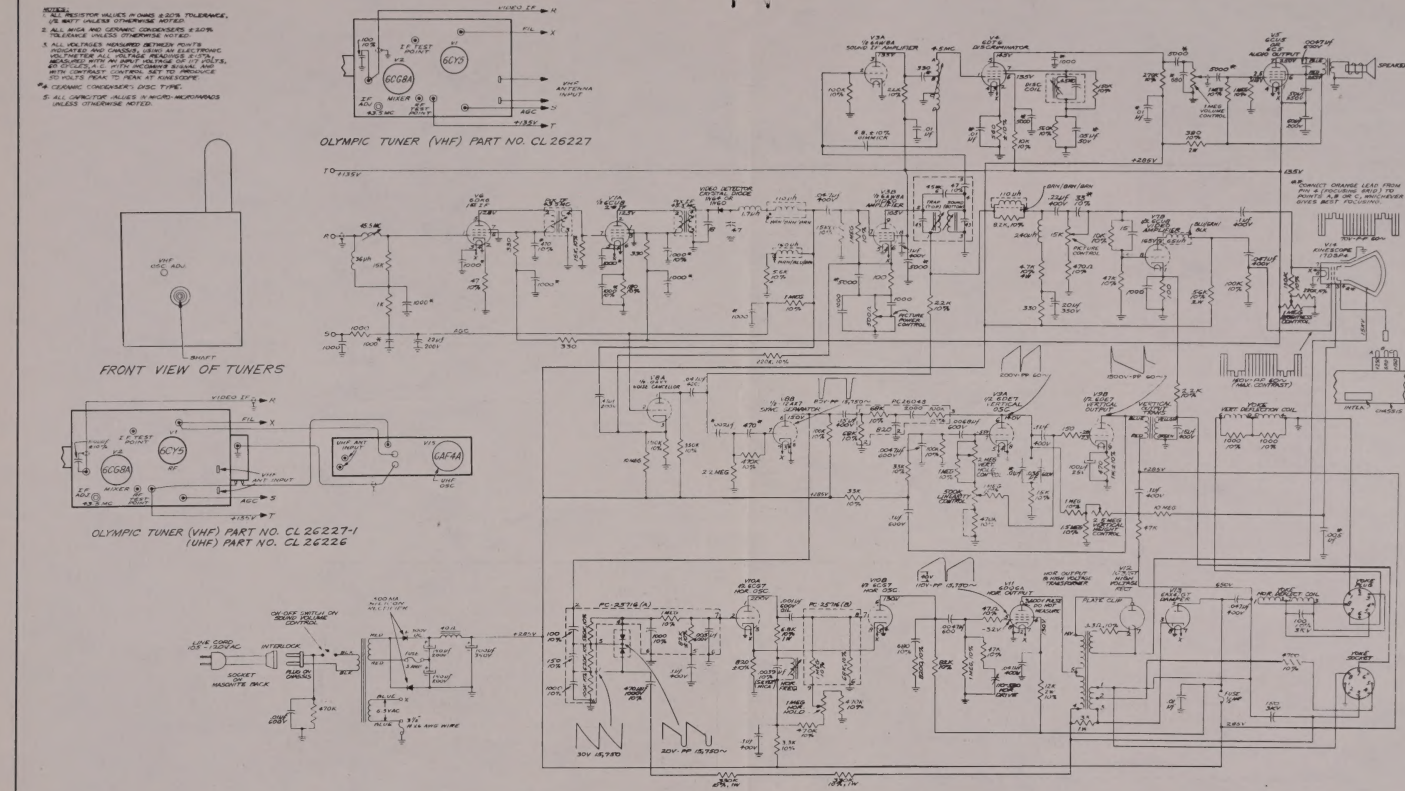
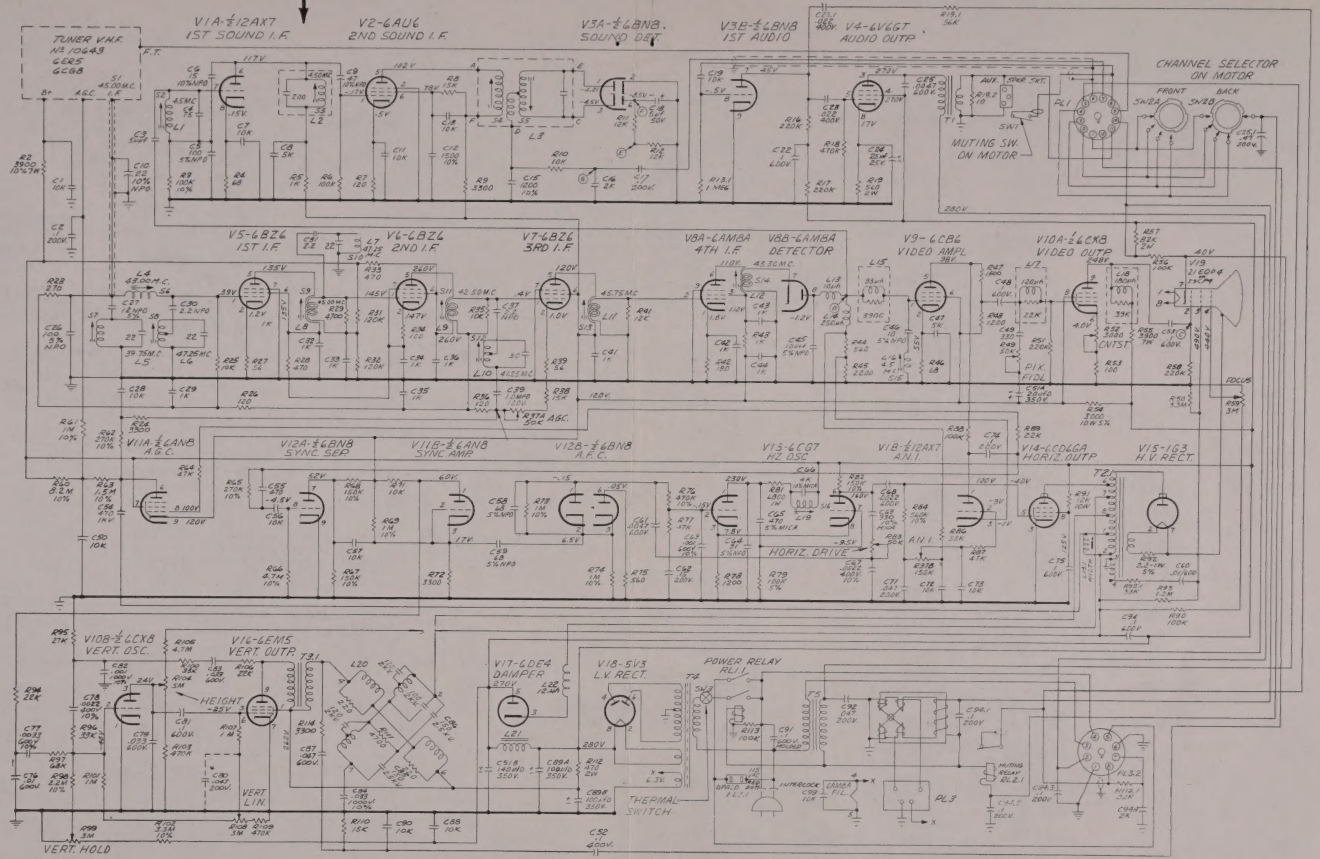
ZENITH MODELS BPS-89L, LZ, BRS-89L, LZ, DPS-89C, DRS-89C


NOTES:
1. ALL RESISTOR VALUES IN OHMS ±20% TOLERANCE, 1/2 WATT UNLESS OTHERWISE NOTED.
2. ALL MICA AND CERAMIC CONDENSERS ±10% TOLERANCE UNLESS OTHERWISE NOTED.
3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND CHASSIS, USING AN ELECTRONIC VOLTMETER. ALL VOLTAGE READINGS ±15%, MEASURED WITH NO INPUT SIGNAL OF 117 VOLTS, 60 CYCLES, WITH PROGRAM SIGNAL AND WITH CONTRAST CONTROL ADVANCED TO MAXIMUM (10 VOLTS PEAK TO PEAK AT KINESCOPE).
4. CERAMIC CONDENSERS: DISC TYPE.
5. ALL CAPACITOR VALUES IN MICRO-MICROFARADS UNLESS OTHERWISE NOTED.
OLYMPIC TUNER (VHF) PART NO. CL 26227
FRONT VIEW OF TUNERS
OLYMPIC TUNER (VHF) PART NO. CL 26227-1
(UHF) PART NO. CL 26226
OLYMPIC MODELS 7TV11M, MU (CH. JV, JVU)
Schematic Diagram Courtesy of Olympic Radio & Television Inc.

← OLYMPIC

PACKARD BELL



PACKARD BELL MODELS 21DK3, 23DK1 (CH. 98D8)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.

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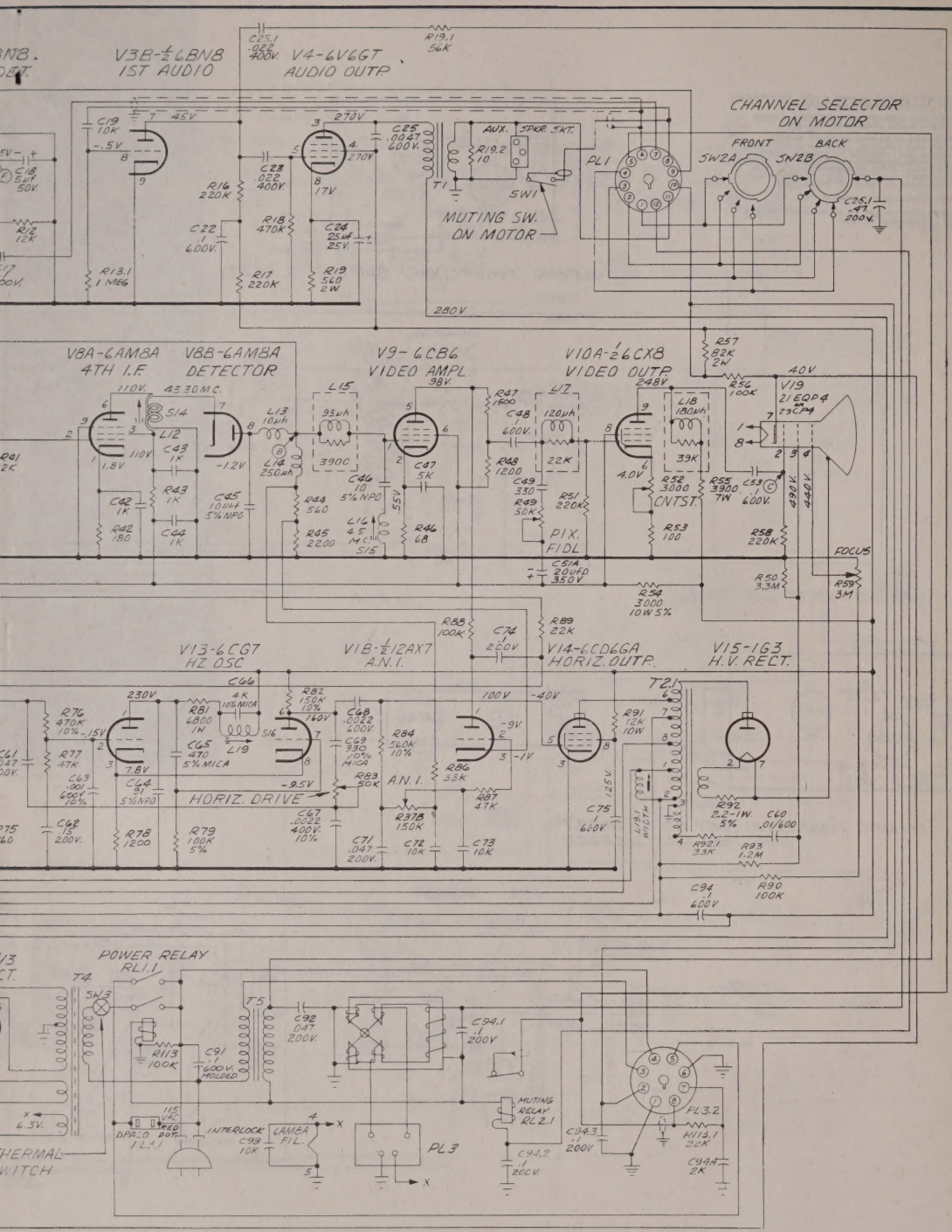

Schematic Diagram Courtesy of Packard Bell Electronics Corp.